OCTOBER
1983

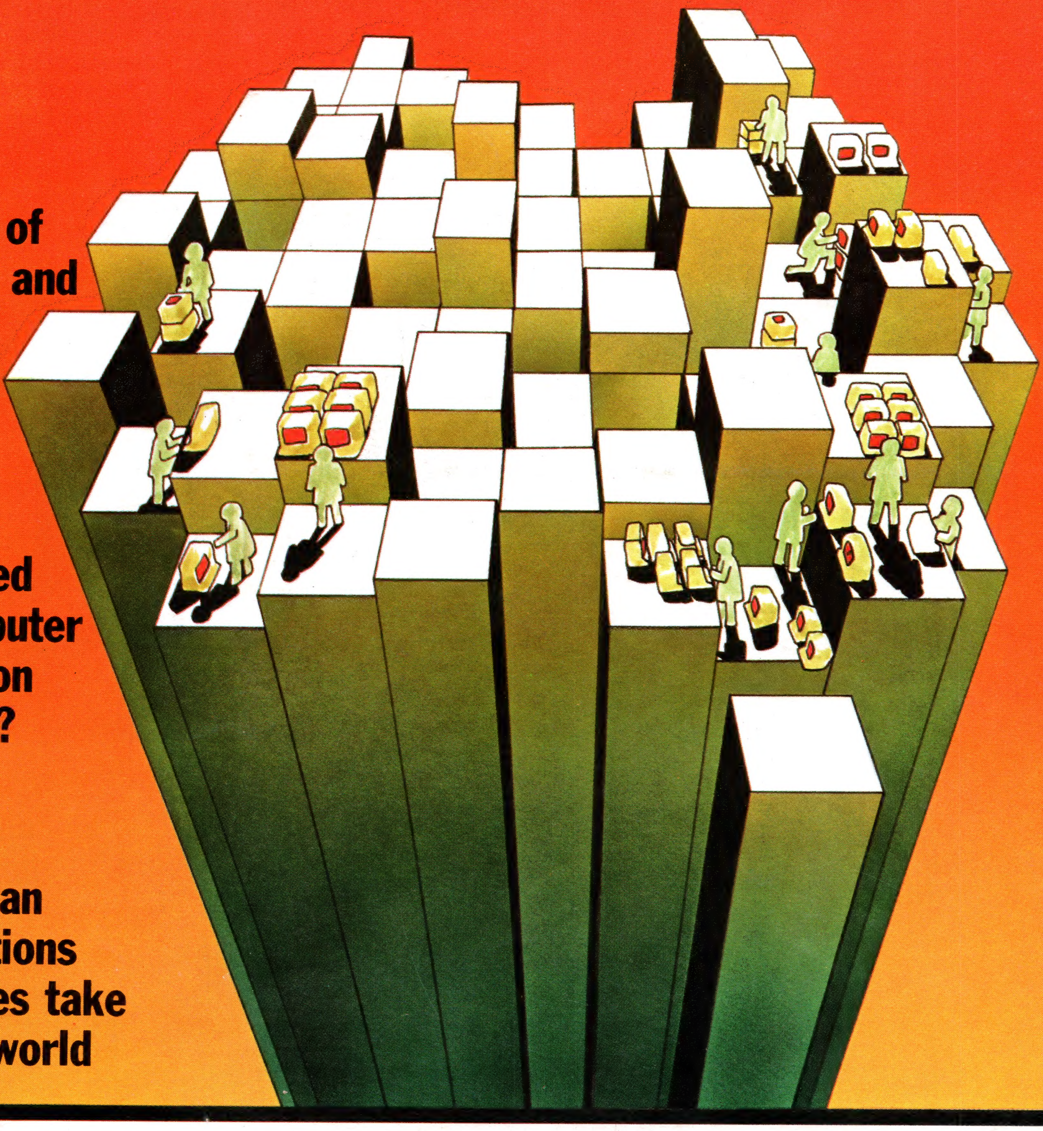
australian Micro computer magazine

ISSN 0811-3866
$2.00*

For people involved in the Australian microcomputing community

AUSTRALIA

We flip the cards on 31 micro manufacturers



also

Review of Labtam and Unison Micros

What's happened to computer education in NSW?

plus

Australian applications packages take on the world

Registered by Australia Post — Publication No NBP 5800 — Category B

DAVONG DELIVERS WHAT EVERY APPLE, IBM, OR OSBORNE USER WANTS.

MORE disk storage
Expand the disk storage of your Apple II*, Apple III*, IBM Personal Computer*, Osborne 1 Computer™ — up to 60 megabytes of fast, reliable Winchester data storage.

MORE value
Davong 5, 10 and 15 megabyte systems are priced at only $2880, $3799 and $4348 (ex tax). Adding additional Davong slave drives costs even less. Everything you need is included. And because the Davong system is universal, your disk investment is preserved, even if you change to a different personal computer.

MORE software
The Davong system includes all the software you need to start right away. And Davong's new Multi-OS™ supports all Apple and IBM PC operating systems.

The Davong Multi-OS operating system gives your computer full multitasking network capability. Complete software support includes back-up and restore programmes.

MORE backup options
Davong offers 18Mb cartridge tape backup at an extremely attractive price.

MORE support
Additional 9 months warranty available.

MORE of what you bought your personal computer for
Better performance, higher reliability, the best value — hard disk storage from Davong.

The Davong Universal Hard Disk also supports most IBM PC- and Apple-compatible computers.

Apple II and Apple III are registered trademarks of Apple Computer Corporation.
IBM PC is a registered trademark of IBM Corporation.
Osborne 1 is a trademark of Osborne Computer Corporation.
Multi-OS is a trademark of Davong Systems. Inc.

Available from all fine
Micro Computer Dealers.

VIC	Alpha Research & Dev.	Michael Porters	789 4658
	Computerland Melb.	Richard Mizgala	662 2133
	Hi-Soft Melb.	Philip Wyman	534 0383
	Metro. Bus. Machines	Ian Hadley	383 2222
	Myer Melbourne	Harry Henderson	66 111
SA	Comp. Prog. Machines	Lindsay Simpson	212 7535
	Myer S.A. Bus. Centre	John Grogan	217 0123
Qld	Computerland Brisbane	Paul Rees	221 9777
	Computer City	Horry Hunt	398 6571

APPROVED i MICROWARE
IMAGINEERING
3/579 Harris Street, Ultimo
Sydney NSW 2007 (02) 212 1411

NSW

City Personal Computers	Peter Sandies	233 8992
Computerland Chatswood	Steve Byrne	411 7611
Computerland Nth Sydney	Rob Byrne	929 4499
Computerland Sydney	Bernadett Nubla	290 2955
Computerland Paramatta	Ray Green	683 3199
Computerland Ryde	James Van Lane	808 2666
Micro Educational	George Parry	049/43 6805
The Computer Shop	Hink Hasima	517 2999
Zofarry Enterprises	Harry Harper	745 1888
Computer Cellar	Ross Dibley	049/67 5700

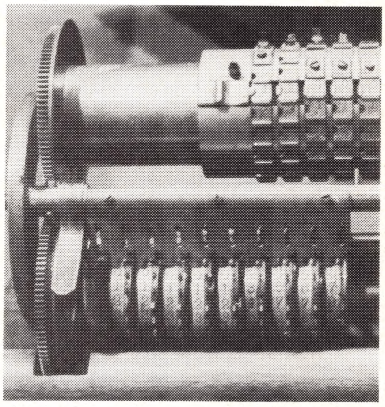
Enter K000 on Enquiry Card

VOLUME 1, No. 7
OCTOBER 1983

Index

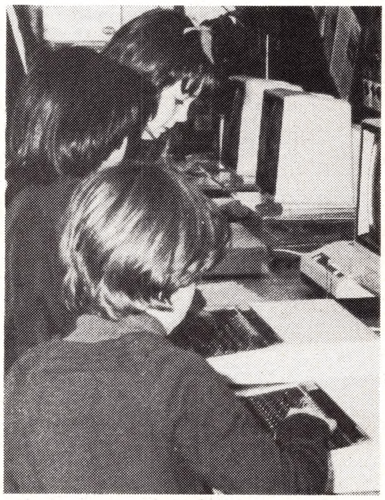
News:

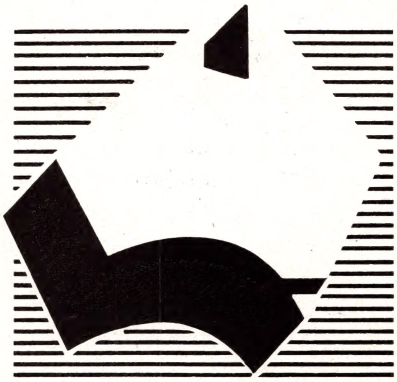
$18M for computer education 5
AWA releases Corona PC 5
HP strives for position 5
Launch of NEC 8200 portable 5
Research Machines distribution 5
Elcon tests vertical market 6
Olivetti cuts prices 6
Amust portable launched 6
NSW education policy 6
Imagineering extends range 6
DG releases desktops 7
Video Classics computes 8
Honeywell releases micro 8
Atari replaces range 8
Networking interest grows 8
Distribution deals 8
Minicomps graphics agency 9
Microsoft takes over 9
World News 10



Features:

Glimpse of a past so recent 12
Avoid the shocks 17
David Angeloro gets physical
Been down so long, it looks like up to me 20
August was computer education month in NSW
Typequick boosts keyboard literacy 28
High technology for a country practice 36
How the mighty chips will shape our future 42
Where are the good "powerful" ideas? 52
Tony Adams explores home computing
Battle for the briefcase 57
Retailing microcomputers with Norman Kemp
Australian microcomputer manufacturers 59
A survey of the industry by Tony Smith
Seven Microvisions 85
Statements from industry and government
Entrepreneur in tune with hobbyists zeal 91
Notes on the run from Applied Technology
Labtam combines power with growth potential 93
Michael Clarke reviews Labtam's Labtam 3000
They're growing in Unison 96
Developing the Unison concept
Seminar puts industry in perspective 101





Product Spotlight:

Lazywriter offers creativity 108
Bank Street Writer at home 109
Micros and writers 110
New face of typesetting 118
Economies of small scale 120
Daisywriter performance 121

Departments:

Movies 127
Books 128
Snapshot 129
Systems 131
Peripherals 132
Microwave 134
Communications 135
Software 136
Applications 138
New Technology 139
Industry 140
Education 142
People 143

Australiana

AUSTRALIA has a small but growing computer manufacturing industry. At least 40 small companies are involved in manufacturing general-purpose computers of their own design. Others are producing communications equipment, circuit boards and control systems.

The slight increase in domestic market share these companies have experienced in the past couple of years is due more to their proliferation than their individual growth. Unfortunately, there are serious structural economic obstacles in Australia which prevent individual companies from being able to grow as fast as the total market.

The importance of a native computer hardware design and manufacturing industry to the nation's future cannot be overestimated. Japan is placing its attempt to maintain its extraordinary growth rate, through the rest of this century squarely on the shoulders of its computer industry.

While Australia is not too late to become an important computer manufacturer, within 10 years the fast turnaround of improved computer aided design systems will drastically step-up the industry's growth rate. Nations which miss that boat may have to revert to lining clouds with silver oxide.

There are, however, several feasible initiatives which must be taken to give Australia a computer industry capable of maintaining our "developed nation" status:

☐ The hardware and software industries and the centres of research must co-operate to facilitate the production of designs and technologies which meet the widest possible needs, rather than just developing products in isolation.

☐ The taxation disincentive for the retention of profits to finance growth must be eased, with the possible introduction of a low-level capital-gains tax to cover any revenue losses and act as a disincentive against investment in non-productive areas.

☐ Government buying policies must favor Australian suppliers, at least to the same degree as those of our major computing suppliers — the US, UK and Japan.

☐ Initiatives to facilitate the formation of private venture capital companies similar to the small business investment corporations which have played an important role in the development of technology-based ventures in the US, in line with the recent Espie committee recommendations to the Australian Government.

☐ A commitment by Telecom, as the only significant computer-related Government organisation, to provide an intelligent high bandwidth communications network to meet all potential requirements, through the introduction of general optical cabling, microwave, cellular radio and similar links.

☐ Pursual of a national project dependent on advanced information technology (rather than earth-moving technology), such as a fully computer-controlled road system with automatic vehicles which would eliminate the cost of the road toll and overcome the disadvantage of those handicapped by lack of equal access to mechanisms for personal mobility.

— *Tony Smith*

australian
Micro
computer magazine

Editor	Ian Webster
Associate Editor	Tony Smith
Chief Sub-Editor	Mike Harrison
Contributing Editors	Tony Adams, Warren Burt, Bill Bolton, Norman Kemp, Ron Pollak

News/Feature Network Infoworld, IBM PC World, ISO World, Computerworld

ADVERTISING

Group Manager	Mike Williams
NSW Manager	Rick Smith
Vic Manager	David Clarkson
Brisbane	Ted Vining (07) 369 7877
Perth	Winkie Corfield (09) 457 6928
Adelaide	John Nankervis (08) 339 1716
Ad Co-ordinator	Judith Seymour

CIRCULATION

Manager Shirley Ingram, Dorothy Adams

MARKETING/DISTRIBUTION

Manager Ken Beever

PRODUCTION

Supervisor Max Jaeger

ENQUIRIES & CONTACTS

Computerworld Pty Ltd, 37-43 Alexander Street, Crows Nest 2065, Australia. Tel: (02) 439 5133 Telex: COMWOR AA74752. Computerworld Pty Ltd, 74-76 Eastern Road, South Melbourne, 3205, Australia. Tel: (03) 690 2933 Telex: ANLGAS AA37037.

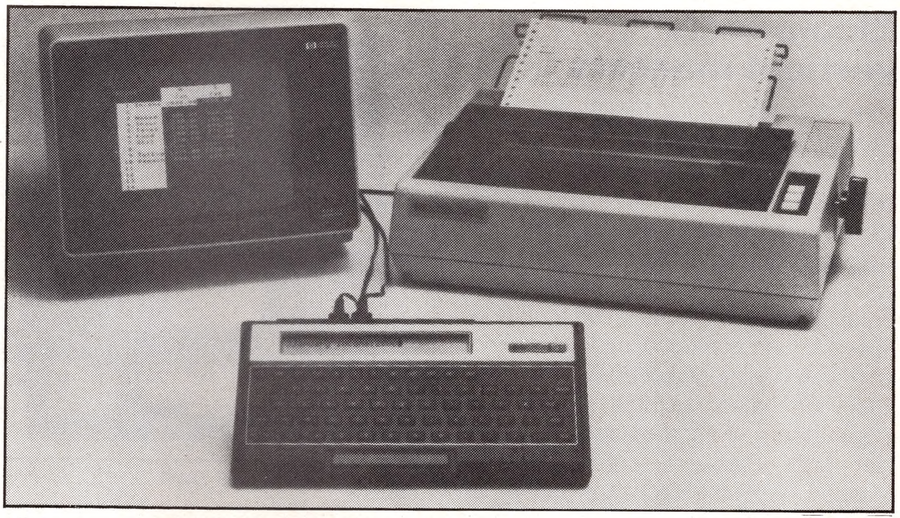
Australian Microcomputer Magazine is published each month by Computerworld Pty Ltd, a company incorporated in NSW. It is available by annual subscription (see detachable sub order forms in each issue) and through newsagents and selected computer retail stores. Reprinting of articles in *Australian Microcomputer Magazine* is strictly forbidden without written permission. All rights reserved. Copyright 1983 by Computerworld Pty Ltd. Other publications published by Computerworld Pty Ltd include *Australasian Computerworld*, the newsweekly for DP professionals; *Office Automation*; directories *Greenbook of Software and Related Services, Redbook of Hardware and Related Services.*

Publisher Alan Power

Printed by GW Graham & Co Pty Ltd.
Alexandria, NSW.

Distributed nationally by Gordon & Gotch.

* Recommended retail price only
Registered by Australia Post —
Publication No NBP 5800 — Category B



Visicalc spreadsheet on HP-75C single-line display, a monitor, or on printout.

$18m pledged to education program

THE Minister for Education and Youth Affairs, Senator Susan Ryan, has released the Federal government's guidelines to the Commonwealth Schools Commission. The guidelines include a commitment to fund a computer education program for $A18 million dollars over three years, starting in 1984.

Initially the program will apply only to secondary schools, and is aimed at helping students understand the uses of new technology and its social, environmental, industrial and economic effects. It will examine the use of computers in teaching and across the curriculum, professional development of teachers, access to the program by girls and disadvantaged groups, and the economic use of resources, including sharing and standardisation of equipment and materials.

The commission has been asked to prepare directions for the program beyond 1984, including the extension of the program to primary schools.

AWA releases Corona micro

AWA has released the US-manufactured Corona microcomputer in Australia. The Corona is based on an 8088 processor with 128K RAM and a 320K disk drive using Microsoft's MS-DOS operating system. The system is compatible with the IBM PC but comes with the Revelation implementation of the Pick operating system.

AWA is committed to the Pick operating system, which is starting to become widely used, offering a range of systems from the Corona to the new 68000-based, multi-terminal Pertec 4200 and the existing Reality Microdata mini computers.

The Corona features high-resolution graphics, four expansion slots and a 10M-byte hard-disk option.

AWA does not intend to distribute the portable version of the Corona at this time.

HP aims at strong market position

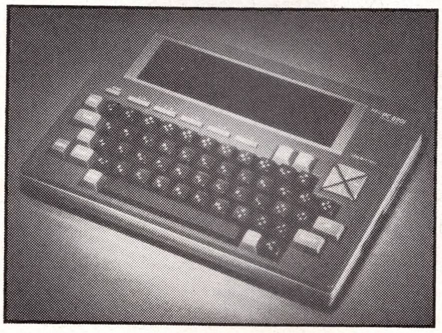
HEWLETT Packard has established a personal computer centre at its Ryde office similar to one recently established at HP headquarters in Melbourne. At the centre's opening, HP managing director, Dr David Booker, predicted a shakeout in the personal computer market and said that HP intended to establish a strong position in the market.

The personal computer centers display the complete range of HP personal computer products and provide advice. HP has also announced the establishment of a toll-free telephone "access line" for users of HP personal computers (008) 03 3055 and has instituted a series of customer training programs.

Product announcements included CP/M-68K for the Series 200, RAM disks for the Series 80 and a new dot matrix printer. Visicorp has prepared a version of Visicalc for the HP75C portable computer in a 16K plug pak that uses the one-line LCD display of the HP75C or a multi-line display on an external monitor.

Rapid launch for NEC briefcase

THE NEC 8200 briefcase portable has been released in Australia, almost at the same time as the US launch, possibly prompted by the market's enthusiastic response to the Tandy M100. The NEC 8200 is manufactured by Kyocera, which also makes the M100 and the Olivetti M10 using similar components and Microsoft's ROM-based software but packaging the systems slightly differently. The NEC 8200 has a different function key arrangement and memory configuration to the M100, offering 16K RAM standard with expansion to 64K RAM and 64K ROM.



NEC's briefcase model.

NEC has priced the 8200 at $A1095 for the 16K version and has bundled 25 programs with the system. Big things are expected for the 8200 with NEC only taking orders for 200 units or more and encouraging widespread availability of the system from retail outlets.

Quest by English schools supplier

RESEARCH Machines, one of two companies which supply approved microcomputers to English schools, is looking for an Australian distributor. A company spokesman at Educare '83 said that he thought there was a place for Research Machines in the Australian education market, particularly the 480Z networked system.

Research Machines makes the 380Z, a Z80-based CP/M system with an installed base of 5000 in English schools, and the 480Z, a Z80 CP/M computer designed for use as a networked system.

Color high-resolution graphics and disk drives are available as options. Microsoft Basic is available in ROM and MBasic, TCL Pascal, Edinburgh Logo and Micro-Prolog are all available under CP/M. A wide range of English educational software is available.

The computer's CP/M strength may give it a foothold in the local market if the Schools Commission's advice favors Applied Technology.

Elcom tests vertical markets

ELECTRONIC CONCEPTS, as well as gearing up for the launch of the Gavilan in Australia, is pushing into vertical market areas. At the launch of Lodgemaster, a hotel-management system running on Apple IIIs networked using Corvus hard disks and Omninet, Rudi Hoess said he believed that there was a strong market for micro networks sharing intelligent resource facilities. Elcon is also distributing the 4th generation Pascal-based system generator, Flexware, and using it to support vertical packages such as Lodgemaster and point-of-sale systems.

Specialist staff will be employed by Elcom to support each application package as it is developed.

Olivetti cuts prices, adds products

OLIVETTI has re-positioned its M20 with dramatic price cuts and the addition of an 8086 processor board as standard. Entry price for the M20 with 128K RAM and single 160K floppy disk drive drops to $A4270 and the M20 with 11.7M-byte hard disk has been reduced $A2000 to $A9565.

Olivetti's Chris Ellis, said the hard-disk version had been the most popular and Olivetti expected to sell 350 M20's this year. A range of vertical market packages is becoming available, including real estate, medical, travel agents, hotel management — and, for crocodile breeders, Oli-Croc.

Ellis also announced Olivetti's non-impact spark inkjet PR 2300 printer.

AMUST has its own briefcase.

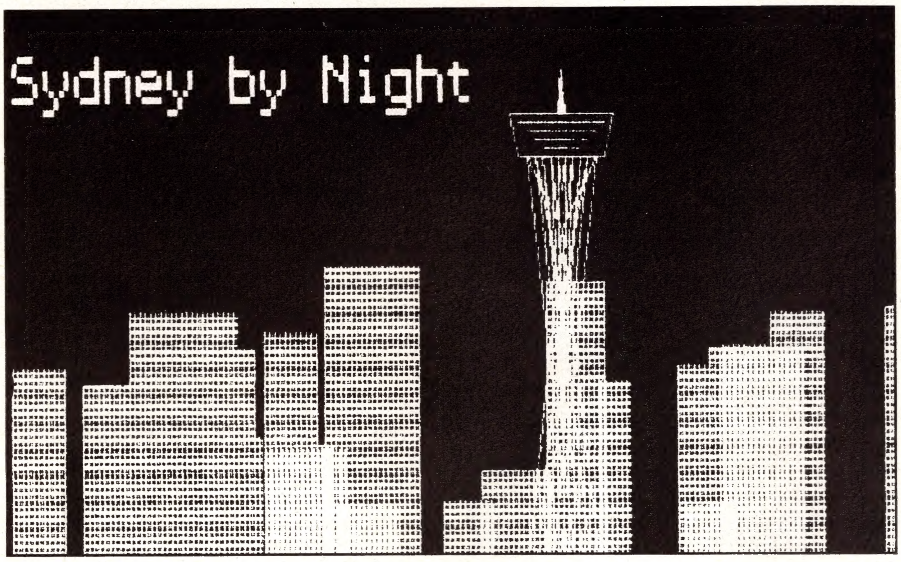
The printer uses a single jet head that composes 7x7 dot characters, is dot addressable and can print at 50 lines a minute. The printer uses ordinary 8in computer paper and features almost silent operation.

Olivetti will also be introducing the M10 briefcase portable before Christmas. The M10 is manufactured by Kyocera, like the Tandy M100 and the NEC 8200. The M10 is very similar to the Tandy M100 with a slightly redesigned case and a tilt-up LCD display. The computer is expected to be distributed widely and sold by many of Olivetti's typewriter dealers as well as major retail outlets.

Portable comes in own briefcase

AMUST held a glittering launch for its new Australian designed and manufactured portable computer. The portable is a Z80, CP/M computer packaged in a standard Samsonite briefcase. The retail price of the Amust 816 will be under $3000 and include a large bundle of applications software.

AMUST has had a lot of success with its range of Epson look low cost dot matrix printers and is well positioned to take advantage of Asian-manufactured peripherals with the Amust Corp of Japan providing capital for a 25 per cent stake in the Australian company.



INKJET graphics from Olivetti PR 2300.

NSW computer education thrust

THE NSW Minister for Education, Ron Mulock, released the department's Computers in Schools policy statement at the opening of the Computer Education Unit last month. The policy document is based on a discussion paper released later year and the responses to that document.

The Computer Education Unit has been established under the leadership of Barry Smith, with four consultants to provide the department with advice and system level support.

The policy document has been well received and is regarded as reflecting the influence of Smith on the Education Department during the past year.

The main difference between the discussion paper and the policy document concerns the use of computers for management. This section has been strengthened following the widespread support for the importance of using computing for distribution and management of resources.

The main priority will be to concentrate on learning about computers in years seven to nine. Minimum goals for all students are an awareness of the implications of computers for the individual and society, experience with computers as tools, an understanding of the areas where computers may be used, practical experience using computer programs in problem-solving situations and awareness of the nature of the a computer program.

Imagineering adds range, outlets

IMAGINEERING, which recently sold its 100,000th software product and is experiencing strong growth in the consumer software market this financial year, will be placing a range of consumer software in selected K-Mart stores.

Managing director Jody Rich said Thorn EMI had appointed Imagineering as distributors for their range of consumer software. A

Thorn EMI spokesman said that Imagineering's experience and track record had been the basis for the decision.

Phil Wooley, Imagineering's marketing director, announced the release of the Mission Control range of Australian-written software for home computers. He said that as well as providing a vehicle for local programmers to have their programs published, Imagineering could offer its contacts with major US companies to assist programmers publish their software internationally.

DG releases its desktop series

Data General's Desktop Generation aims at low-end mini market.

DATA General has released a series of desktop microcomputers based on a 16-bit implementation of DG's Eclipse processor. The lowend Model 10 features an 8086 that will support MS-DOS concurrently with the DG operating systems AOS and RDOS. The systems use 5in 378K disk drives, excellent high resolution color graphics hard disk and floating point options.

The Model 20 and Model 30 are multi-terminal systems that also use the micro Eclipse procesor and offer compatibility with Data General's range of minicomputers.

The new desktop computers support DG's comprehensive electronic office (CEO), and a line of industry-standard and IBM-compatible data communications products.

Data General is positioning the systems as a lowend extension of its minicomputer range, offering a compatible operating environment and referring to the machines as the "Desktop Generation", not as personal computers. This strategy is similar to several other traditional computer manufacturers who are attempting to protect their market positions without becoming involved in the extreme pressures of the personal computer market.

Data General's new general manager, John Filmer, said he expected the

Flawless performance and guaranteed until 1989

That's right! Verbatim® Datalife® flexible diskettes and minidisks offer flawless performance to ensure that your valuable data is safe. And because our Datalife range is so good, we offer a 5 year warranty — that's FIVE TIMES LONGER than industry standards. So you can be confident that when you buy Verbatim® Datalife®, you have a disk that will last.

Our name is the promise.
Our warranty is the proof.

Verbatim®

For information about Datalife® Disk, call 008 022023 from anywhere in Australia for the cost of a local call.

VTM 7

Enter K060 on Enquiry Card

systems to provide an opportunity for many of the vertical market applications available on DG minicomputers to migrate down to the new systems.

The systems will be available from Data General and OEM distributors, and should provide strong compeitition for the "shared bus" multi-user, microcomputer systems that are popular at present. Prices start at $A5000 and range up to $A17,500.

Video Classics' computer move

VIDEO Classics, following its successful launch as a public company, has created a new computer and consumer electronics division, Computer Classics. The company will address itself to the consumer market with the development of hardware and software products for recreational, educational, home and small-business applications.

Gerry Gerlach heads the new division, while Roger Davis, previously national sales manager for Commodore and the driving force behind the success of Commodore in the Australian home-computer market, becomes product manager.

Roger Davis said Computer Classics would pursue the enormous potential of the home computer and consumer electronics market in Australia, both supporting the Video Classics retail chain and becoming involved in the development and distribution of Australian software and other emerging areas of consumer-orientated high technology.

Computer Classics' Roger Davis.

First micro system from Honeywell

HONEYWELL has released its first microcomputer system, the Microsystem 6/10. The 6/10 is based on a 16-bit processor, the Honeywell Micro-6 and an 8086 processor. The computer supports Honeywell's GCOS operating system, providing compatibility with its DPS 6 range of minicomputers and the CP/M-86 and MS-DOS environments. It features 128K RAM, two ports, detached keyboard and 650K drives with hard-disk options.

A multi-user system, the Microsystem 6/20, is also available, supporting four users with 1M-byte of memory and a 40M-byte hard disk. Prices range from $A5000 to $A17,000.

Atari updates home computer range

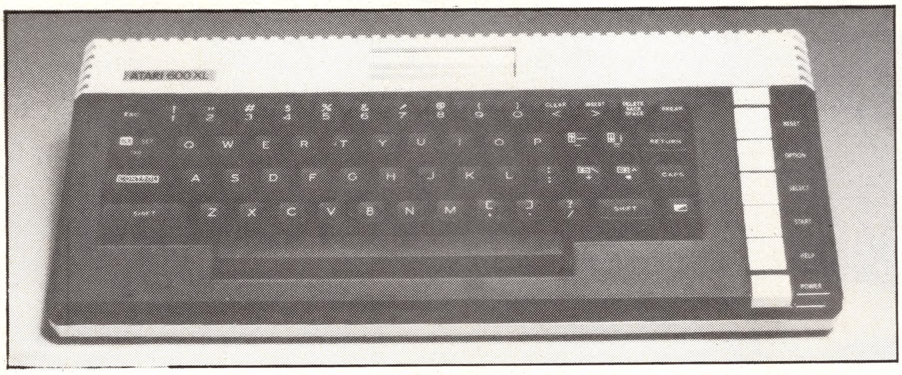
FUTURETRONICS has released Atari's new range of home computers. Atari has replaced the Atari 400 and 800 as well as the recently released 1200XL with four models.

All the machines are similar to the previous range, featuring the same color graphics and 6502 processor. The 600XL has 16K memory, expandable to 64K and will retail for $A399. The 800XL has 64K of memory and will retail for $A599. The 1400XL and XLD are 64K computers with built-in voice synthesis and disk drives.

A range of peripherals is available including a 127K disk drive, four-color printer/plotter, 20char/sec letter quality printer and a CP/M module.

Most of the software available for the previous range of Atari machines is claimed to run on the new models and Atari has released a cartridge version of Logo, word processing and graphics software for the new machines.

Futuretronics experts to sell 10,000 computers before Christmas and 30,000 next year after supply problems for the top-end models ease.



Atari's 600XL home computer.

Networking soon a major interest

PERSONAL computer communications is finally emerging as an area of interest in Australia. A spokesman for DataSat said his company had received good response to its auto answer modem which is the essential technology for the development of personal computer networks. He said he expected the market to become very competitive and prices to drop once the volume of orders started to build up.

The DataSat modem is being used by as a replacement for Telecom modems by several large organisations and as the modem for several of the CBBS bulletin board systems established in Australia.

Centre Industries has also reported a lot of interest in its direct connect modem. New releases of a $199 direct connect modem from Electromed and a $195 direct connect modem from RF Communications in Melbourne should promote continuing user interest. The Apple User community intends establishing several bulletin board systems next year, and the re-emergence of the Australian Beginning should ensure that 1984 will be the year of personal computer networking in Australia.

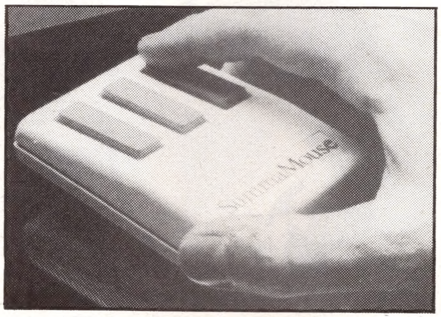
Distribution deals for varied products

SEVERAL distribution arrangements have been finalised recently. The Fortune 16/32, an upmarket, 68000-based, multi-terminal system that has been available from several Computerland stores will be distributed in Australia. The stylish, IBM-compatible lished by Ian Pratt, formerly from Basic 4. Fortune has been one of the US venture capitalists, glamor companies and the new arrangement should see a much higher profile for the system in Australia.

The Canadian-manufactured Hyperion is about to be widely distributed in Australia. The stylish IBM-compatible portable generated a lot of interest at this year's PC show. Peter Ackerman, spokesman for the distributors, Zabron, expects the Hyperion to be available from a network of independent dealers and one of the national dealer networks in September.

The Apple II-based Alpha Syntauri music system, which was distributed by Electronic Concepts, is now to be distributed by, Sydney-based, Compu-Music. The Alpha Syntauri system, based on the Mountain Hardware music system, features eight polyphonic voices and a four or five octave velocity sensitive keyboard. The system software includes a digital 16-track recording system and a composer's assistant that produces printed scores of music compositions.

A Melbourne-based company, The Software House, has been appointed local distributor for the Select word processing package and the CP/M Teach tutorial program. Select has a strong user-oriented reputation, pioneering the use of disk-based teaching programs to support the user. Select will be available from computer dealers.



The optical Summamouse.

Graphics agencies to Minicomp

MINICOMP, one of the Cromemco distributors in Australia, has acquired the rights to distribute Modograph's Smart Graphics GX-100 terminal, multiple-page high-resolution graphics and has been designed to run Tektronix's Plot 10 and DEC's VT-100 graphics software. The system can be used as a terminal or extended to a standalone CP/M system.

Minicomp has also acquired the agency for Summagraphics, a leading US manufacturer of low-cost digitisers and graphics input devices.

The Summagraphics range of digitiser tablets will be available in October together with the Summamouse, an optical mouse that has been selected by Visicorp for packaging with the Vision system.

A spokesman for Summagraphics said that his company had investigated mechanical mice and found that there were wear problems which could only be overcome using optical technology. Visicorp has selected the Summamouse for its Vision system and the mouse will also act as the system key, with each copy of Vision keyed to a mouse-based ROM. The Summamouse will cost $A400.

Microsoft takes over distributor

MICROSOFT has taken over its Australian distributor, Wiser-Microsoft. Scott Oki, Microsoft's international vice-president, said the move was to support Microsoft's commitment to the Australian market with the release later this year of Multi-Tool Word.

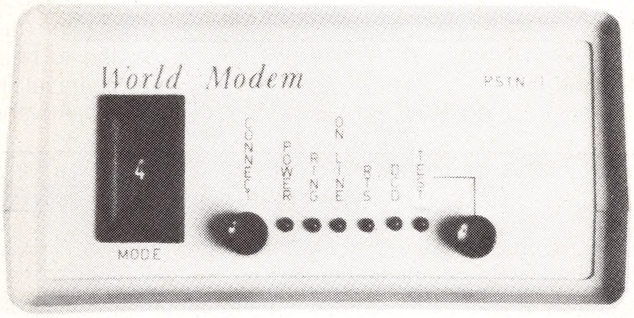
Linda Graham will continue as general manager of the company.

WORLD DATA COMMUNICATIONS

BUSINESS FEATURES:

- Budget price results in substantial **cost savings** over renting.
- Integral Auto Answer **and** Disconnect Programme.
- Extended 6 months warranty with modem handshake service.
- Designed and **manufactured in Australia.**
- Integrated Modem versions to **OEM** specifications.
- Telecom Authorisation No. C83/37/1014.

300 bps FDX or 1200/75 bps HDX



AUTHORISED DEALERS:

Typewriter City Discounts	**(02) 267 8847**
General Technology Pty Ltd	**(02) 498 2826**
Wilbaran Pty Ltd	**(03) 781 2677**
Alfatron Pty Ltd	**(03) 758 9000**
Vince Lipton Services	**(075) 32 8806**
City Personal Computers	**(02) 922 3600**

For dealership enquiries contact:
DATA SAT AUSTRALASIA PTY LTD
Telephone (02) 525 6688.

Enter K080 on Enquiry Card

World News

A round-up of information from the CW News Network

Concurrent approval

IBM has authorised its direct salesforce and product centres to market Digital Research's Concurrent CP/M-86 operating system for the IBM Personal Computer.

Concurrent CP/M was one of eight third-party software products that recently received IBM's seal of approval under a new non-logo distribution program.

IBM has also formed an entry systems division, which combines the company's entry systems product activities in Boca Raton, Florida, and its office workstation product activities in Austin, Texas. Philip Estridge, who headed the development of IBM's Personal Computer, becomes president of the division.

The division in Boca Raton will have worldwide responsibility for development, product management and US manufacturing of IBM's low-cost, high-volume personal use systems. It will provide a single management focus for all its low-end systems.

Apples in home

"HOME is where the Apple is."

With that slogan, Apple Computer Inc launched a major new advertising campaign that analysts say will eventually define market positions for the Apple IIe, the MacIntosh and the Lisa.

The advertisements will position the Apple IIe squarely in the home market, the unreleased MacIntosh in the middle business market and the Lisa in the high-end business market.

Apple took its first step toward IBM PC compatibility recently when it disclosed plans to make an add-on board with an 8088 processor and a version of the MS-DOS operating system available for the Lisa.

A spokesman said Apple's plan to offer an MS-DOS option was in keeping with its overall strategy to provide industry standard operating systems, such as CP/M 68K and Xenix, for the Lisa.

The Apple community has been delighted by the news that the soul of Apple, renowned prankster and engineer Steve Wozniak, has returned to the company he co-founded seven years ago.

Though he modestly says he is just dabbling in a few simple projects for the Apple II and III, Woz does concede, when pressed, that he wants to design a new computer.

Osborne boost

OSBORNE has released an IBM-compatible board for its Executive 1 transportable and claims it will be compatible with 98 per cent of IBM PC software.

A spokesperson for Osborne said with the add-on board the Executive 1 would cost about $US3000. It would compete against the Compaq which is $US500 dearer.

The release date for the Executive 2, a system consisting of the Executive 1 with the add-on board built in, will not be determined until the company has gauged acceptance of the Convertible Pac. The new board for the Executive 1 — due on the market in November — is expected to help Osborne's recovery from financial troubles.

Otrona Advanced Systems has also plunged into the IBM-compatible arena by introducing a dual-processor portable. The Attache 8:16 features dual Z80A and 8086 processors and 256K-bytes of RAM.

The new machine is the first portable with the 8086 processor to reach the market. Both CP/M 2.2 and MS-DOS 2.0 are standard.

Retail price for the Attache 8:16 is $US3495 for a model with a single floppy drive and $US3,795 for a double-drive version.

Convergent diverges

IN a significant departure from its high-end OEM workstations, Convergent Technologies is to introduce a computer portable costing less than $US1000.

Convergent, which will call its new machine the Workslate, will initially rely on American Express to market the computer to its cardholders, but the company will then offer the Workslate through retail channels. The Workslate is "somewhere between a calculator and a computer'" because of its limited range of software applications.

Tax disappointment

NEW ZEALAND micro sales may be set to rise again after the government failed to cut sales tax in last week's budget. Sales tax on computers in New Zealand is 40 per cent, the world's highest, and a variety of pressure groups have been pushing for a reduction.

The Industries Development Commission report on the electronics industry recommended a cut to 10 per cent, and while most market observers did not expect such a big drop, many had looked for some movement. In the wake of a recent ministerial comment that the government would be reviewing the IDC report, computer sales, especially micro sales, have slumped. While the computer industry is disappointed that the Budget gave no recognition to its case, the word is that the Minister of Trade and Industry, Mr Templeton, may have some good news at the forthcoming national electronics conference at the end of next month.

Radio terminal from Motorola

MOTOROLA has introduced a new portable communications terminal that is free of the need for any wires, even to recharge the battery. It operates via a two-way radio link to a base station, within an area up to 176 square miles.

The new portable communications terminal uses two 8-bit microprocessors, has 80K of RAM and 160K of ROM and sports a full keyboard with a two-line, 54-character LCD display. It weighs only 28 ounces and runs all day on a single battery charge. Since the terminal communicates in the 800Mhz range the antenna is small enough to be completely contained inside the case. At $US2000 to $US4000 each for the terminals, and $US15,000 to $US20,000 each for the base stations, Motorola expects that its new radio-controlled terminal, and possibly others like it, will capture up to 15 per cent of the portable-computer market by 1990.

Try **before** you buy...

It's easy to be wise — with hindsight. How often the purchase of a piece of computer hardware has been regretted, after a short "hands on" experience in the sales room. Perhaps a far wiser decision could have been made had there been a greater opportunity for a proper testing of the equipment in a realistic working environment over a reasonable period of time.

This precise purchase pattern is now available through TECH-RENTALS PTY LTD.

Additionally this remarkable service is backed with our . . .

MINIMUM DOWNTIME CHANGEOVER

Any equipment rented or purchased by our customers, is covered by this facility. In event of a fault developing in any component of a system, the customer notifies Tech-Rentals and a replacement unit is despatched immediately. The original unit is then returned to Tech-Rentals for repair.

Consequently, a minimum of time elapses between the discovery of a fault and replacement of the unit, thus enabling the customer to maximise productivity of both the system and personnel using the system.

This exciting purchase plan does not end there . . .

MAINTENANCE AND SERVICE BACKUP

Due to the expertise and capabilities of our sales and engineering staff, we are uniquely situated to provide software support and maintenance on hardware in the major metropolitan and country areas of Australia

By offering the equipment for sale, short term or long-term rental, we can provide an immediate solution for customers with urgent requirements, while customers who purchase equipment benefit from the prompt and professional service facilities which are essential to maintain user sites.

IBM Authorised Dealer
IBM
Personal
Computer

and you can buy and be certain.

OUR SERVICES

Tech-Rentals provides a full line of high technology equipment from terminals, printers, acoustic couplers, modems and software to micro computers. Our range and stock of micro systems equipment, whether dedicated or standalone, is unmatched anywhere in Australia.

COMPUTERS

- IBM — PC and PC-XT
- APPLE II
- APPLE III
- APPLE LISA
- HP 80 Series
- HP 100 Series
- HP 200 Series
- Peachtree Software

TECH-RENTALS PTY. LTD.
INCORPORATED IN VICTORIA

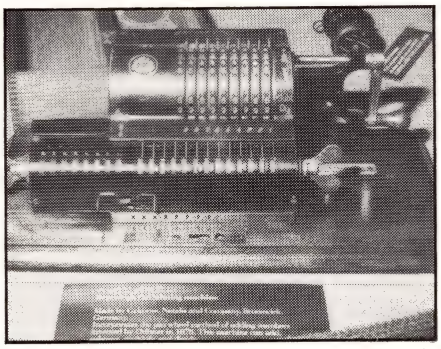
MELBOURNE:
83-87 Wellington Street,
Windsor, Victoria 3181.
Phone (03) 51 1303.
Telex: AA30418 ELTGNT.

SYDNEY:
37-43 Alexander Street,
Crows Nest, NSW 2065.
Phone (02) 438 2199.

PERTH:
46-48 Kings Park Road,
West Perth 6005.
Phone (09) 322 1085.
Telex: AA94765 AUSHOP.

AUCKLAND:
P.O. Box 9564, Auckland, New Zealand. Phone (9) 50 4759. Telex: 2451.

HOTLINE (03) 51 1303



Calculator using pinwheel method.

Glimpses of a past so recent, yet so distant

From pinwheel calculators and office comptometers, it was a headlong rush into the computer age — with punchcards, Silliac's valves, magnetic ferrite memory core and massive circuitry.

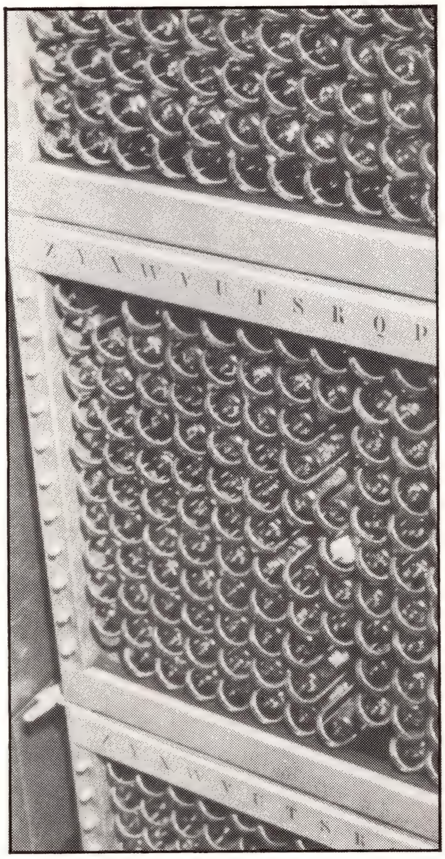
AN IBM-sponsored exhibition at Sydney's Power House museum has provided a fascinating opportunity to experience the "onrushing wave of change" so often associated with the computer industry. The exhibition, "Calculating to Computing", brought together equipment from the museum's own collection, private sources at the University of Sydney, and the IBM Australia collection.

The exhibition — assembled for Information Technology Week — begins with a display of 19th-century mechanical calculating devices, largely based on Thomas de Colmas's arithmometer principle and the pinwheel mechanism, providing addition, subtraction, multiplication and division. Several logorithim machines are also on display culminating in that great pre-electronic calculating device, the slide rule. Two comptometers or keyboard-calculating machines from the early 20th-century complete the display of mechanical machines.

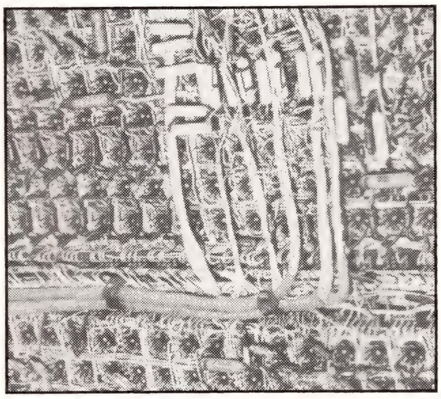
Herman Hollerith's development of a punched card system to automate the US census appears to have dominated much of IBM's design philosophy, since the company emerged from a merger between Hollerith's company and several others, creating the Computing - Tabulating - Recording Company managed by Thomas Watson.

The two IBM machines from the 50s are punchcard driven. These are an IBM 604 calculator based on six banks of 26 x 11 valves, with a primitive front panel to indicate the operational status of the machine, and a 407 punchcard accounting machine making extensive use of relays.

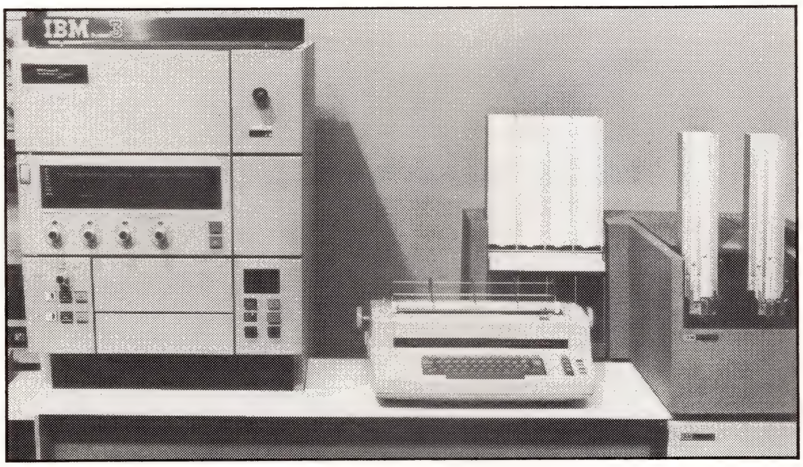
A small piece of Australia's comput-



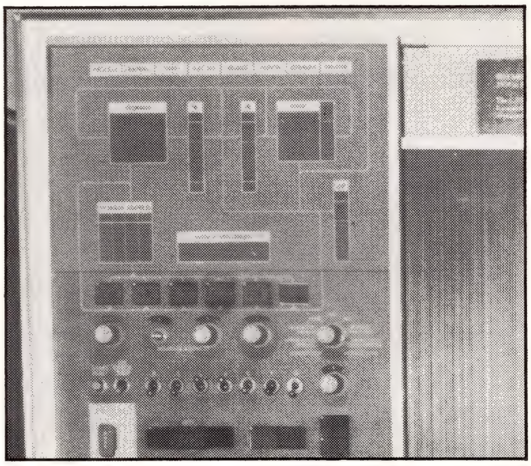
Valve array from 1953 IBM 604



The IBM 604 backplane.



1970's System 3, IBM's first small business machine.



Front panel of IBM 1401.

ing history is included with a valve register from Silliac, the second computer built in Australia in 1953 at Sydney University.

The IBM 1401 CPU is a transistor-based machine available from 1959-1963 that featured the 7330 magnetic tape drive and, in 1962, the first removable disk storage system with the 2M-byte 1311 disk drive.

The legendary IBM 360 family, a shared logic machine released in the 60s, that offered 2.5 million additions per second, a ten-fold increase over the 1401, is represented by a front panel, usually the only relic of these systems that survive. IBM's first small-business machine, the System 3, introduced in 1970, is featured together with the first VDU, the 3277.

The 370 series is represented by a 370/168 central processing unit with integrated VDU.

The display finishes with the IBM 5100 portable, a little-known machine released in 1975 that was an important part of IBM's ongoing effort to explore the development of computing strategies, and several IBM-PC's configured to amuse visitors to the museum.

CRT terminal of the 70s — IBM's 3277.

In the centre of the exhibit is a component display featuring a relay, valve, 1401 transitor and resistor-circuit board, magnetic ferrite memory core array from the 360 and the monolithic circuits developed for the 370 series, followed by a multilayer chip module, containing nine separate chips, that is used in the 4300 family.

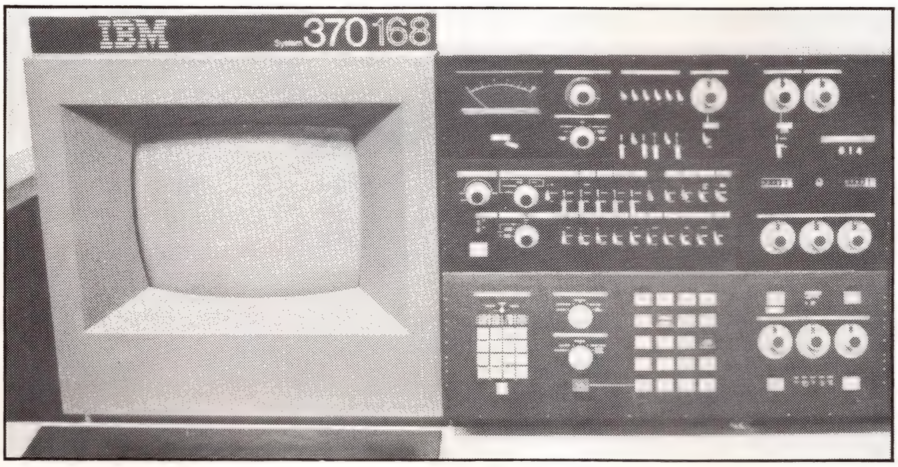
Many people don't realise that IBM doesn't use the conventional chip cases familiar to many but its own aluminium encased packages.

This important exhibition illustrates the extraordinary compression in the development of computer technology and also the conservatism of the design philosophy of companies like IBM.

Externally, there is little difference between the 604 of the early 1950s and the 370/168. IBM designers' predeliction for festooning their front panels with mechanical switches and dials has defined the computer for movie and television audiences over the past 20 years.

The display will be dismantled in September, but may re-appear in Stage III of the Power House, which will have a large permanent exhibition of computing equipment. The museum's very popular but trite computing laboratory will be complemented with the extensive use of computer-driven exhibits in the new stages of the museum.

IBM is believed to be preparing a major exhibition as part of the bicentennial celebrations in 1988.



Dials and switches crowd 370/168 front panel.

$500

'INFORMATION BUSINESS MANAGER'

COMPLETE ACCOUNTING PACKAGE FOR ALL CPM/CPM86 MICROS

THIS AUSTRALIAN DEVELOPED PACKAGE INCLUDES:

- ★ Accounts Payable
- ★ Stock Control
- ★ General Ledger
- ★ Accounts Receivable
- ★ Invoicing

ALL FULLY INTEGRATED COMPREHENSIVE MANUAL

DEALER ENQUIRIES WELCOME

Also available:

- ★ Real Estate System
- ★ Insurance Broker System
- ★ Disk Cataloguing Program
- ★ Other CPM Software

A & M COMPUTER SOLUTIONS PTY. LTD.

**353 BURWOOD ROAD,
HAWTHORN 3122.
Telephone: (03) 818 0595**

Enter K030 on Enquiry Card

New WORD/SCRIBE™ Printers from Anadex:

Lasting Impressions.

STOP PRESS
FACTORY ANNOUNCES
HUGE PRICE REDUCTION
ACROSS COMPLETE RANGE

Letter Quality and Finished Correspondence. High Speed Drafts. EDP Reports. Charts and Graphs. Now you can have them all in one very impressive package: Word/Scribe.

Our versatile new multi-mode printer, the Word/Scribe Model WP-6000, uses our new 18-wire print head and some exceptional engineering to produce crisp characters and razor-sharp graphics. Quality-built to meet your most exacting printing needs.

Word/Scribe gives you letter quality printing with 10 or 12 pitch or proportional spacing, at speeds up to 150 CPS; correspondence quality up to 205 CPS; and draft/data processing up to 275 CPS.

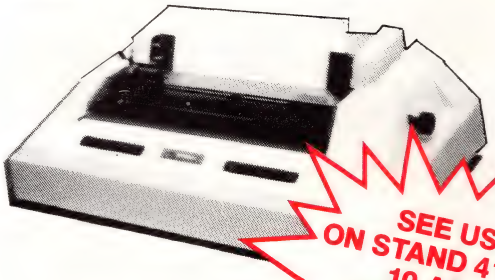
Equally impressive are Word/Scribe's interfaces: RS-232-C Serial and Centronics compatible parallel with a sophisticated communications capability.

And for word processing we've added a Diablo 630 emulation package so you can save your software when you update your printers.

Friction feed, tractors, automatic sheet feeders, over 20 kbyte buffers, a variety of character sets (including your own, down-loaded), the impressive list could go on . . . But maybe you're not **quite** ready for Wordscribe 6000! Then ring us now for details on our complete printer family-multimode high resolution, graphics plus, fast draft, forms handling options . . . we think you'll be impressed.

Anadex®

MADE IN USA FOR THE WORLD



The Impressive Word/Scribe from Anadex. Of Course.

SEE US ON STAND 41/42 10 ACC MELBOURNE 27-30 SEPT

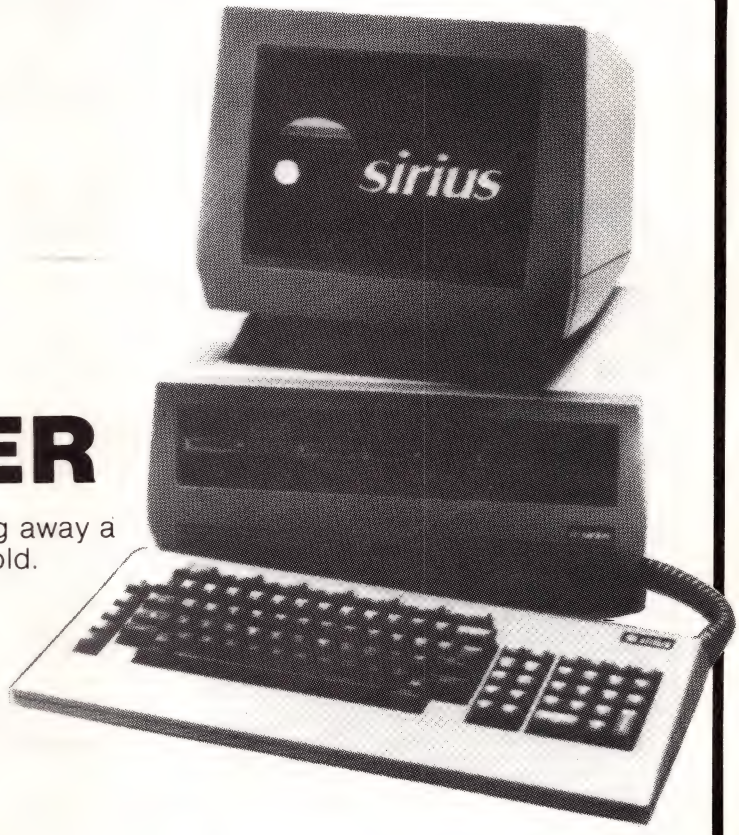
DATASCAPE

Datascape Int Pty Ltd.
33 Grosvenor Street,
Neutral Bay Junction, NSW
Telephone: (02) 909 1233
Telex: AA 71150

MELBOURNE:	(03) 690 3622
ADELAIDE:	(08) 332 8666
BRISBANE:	(07) 371 7366
HOBART:	(002) 72 8622
CANBERRA:	(062) 80 5283

C TECH

COMPUTER DIVISION OF
RITRONICS WHOLESALE PTY LTD



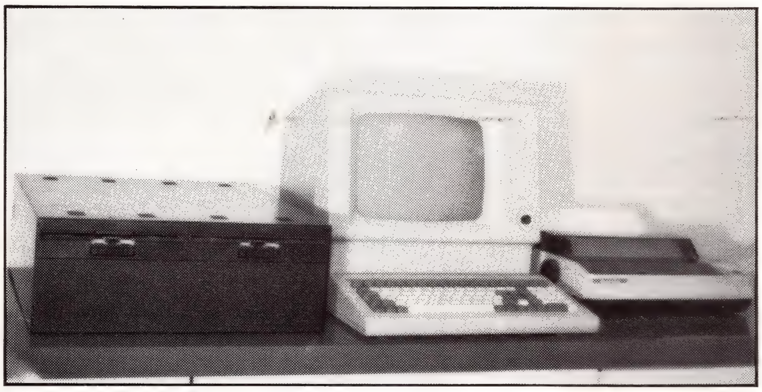
FREE PRINTER

To kick off our computer division we are giving away a free CP80 printer with every Sirius computer sold.

Our price for Sirius 1 with 1.2Mb storage on twin drives is **$5250.00**

SIRIUS 1 with 10Mb Hard disk and a 1.2Mb floppy for backup + 256K ram is **$9750.00** + tax

REMEMBER THESE PRICES INCLUDE A FREE PRINTER



THE RITRON WORKHORSE

Let us introduce you to our workhorse. This is not a pretty little computer which looks great and does nothing. Its built purely for hard work.

Its our own RITRON computer built on the big board 2. It comes complete with a professional ICL terminal. It has 64K ram, CP/M runs at 4MHz, has a disk storage of 2.4Mb on 20cm drives. That means you'll have no trouble loading software from other sources.

And this month we are giving away a free CP80 printer with every system sold.

Other features of our computer include DMA for fast disk acces and a hard disk interface for when you want to upgrade your storage requirements. **$3950**

CHECK OUR PRICES
on
Computer Paper, Disks & Printer Ribbons

10″ PAPER	$29.00/2000
15″ PAPER	$39.00/2000
5″ DISK HEAD CLEANER	$12.60
8″ DISK HEAD CLEANER	$14.30

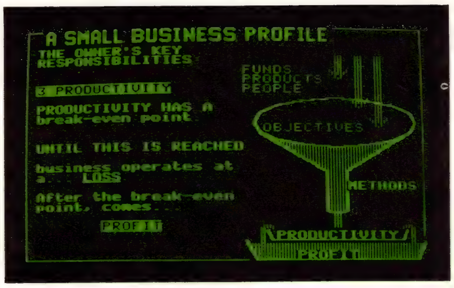
CICADA MODEMS
$200 Answer Originate
300 Baud

All prices shown are subject to sales tax

C-Tech Pty Ltd, 48 A'Beckett Street, Melbourne. Phone 347-7917

If you really want to know — ASK!®

Small business needs a key to the accounting scene.


A SMALL BUSINESS PROFILE
THE OWNER'S KEY RESPONSIBILITIES

3 PRODUCTIVITY

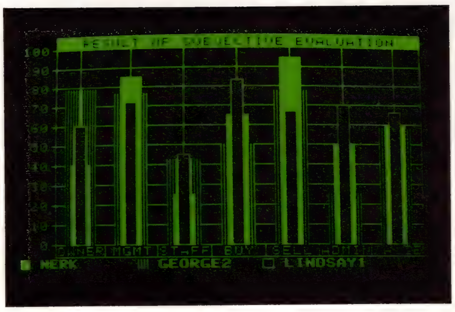
PRODUCTIVITY HAS A break-even point.

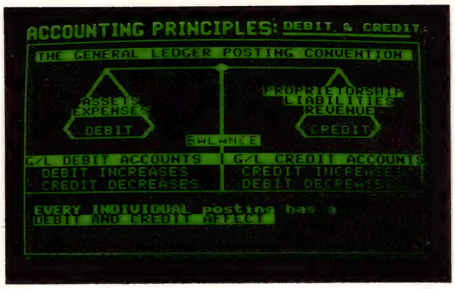
UNTIL THIS IS REACHED

business operates at a... LOSS

After the break-even point, comes...

PROFIT

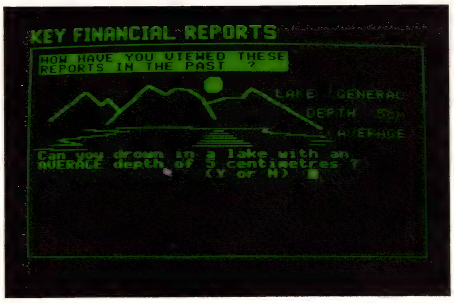



ACCOUNTING PRINCIPLES: DEBIT & CREDIT

THE GENERAL LEDGER POSTING CONVENTION

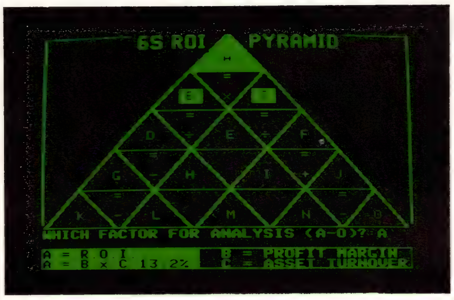
G/L DEBIT ACCOUNTS	G/L CREDIT ACCOUNTS
DEBIT INCREASES	CREDIT INCREASES
CREDIT DECREASES	DEBIT DECREASES

EVERY INDIVIDUAL posting has a DEBIT AND CREDIT AFFECT


KEY FINANCIAL REPORTS

HOW HAVE YOU VIEWED THESE REPORTS IN THE PAST ?

Can you drown in a lake with an AVERAGE depth of 5 centimetres ? (Y or N)


6S ROI PYRAMID

WHICH FACTOR FOR ANALYSIS (A-O)? A

A = R.O.I.
A = B x C 13.2%
B = PROFIT MARGIN
C = ASSET TURNOVER

What advice would you give these people?

EXAMPLE 1
18 months ago Mr L. was worried by declining custom due to a large department store nearby. He decided to fight back by reducing profit margins, while increasing floor space, merchandising lines, his advertising. A 'bulk store' approach. All these changes required extra capital and extra effort. He now has his first full twelve months trading results.

Is this the BETTER way to operate? PROFIT is only part of the answer.

EXAMPLE 2
Mr C. started a business 36 months ago with $10,000 capital. From a slow start, things appear to be heading in a positive direction, with steady sales increase. However, more capital is needed to fund charge customers and increase merchandise inventory.

Does PERFORMANCE justify this? Is the business capable of servicing these added overheads?

A.S.K. and get the answers!

STAGE 1 — INITIAL EVALUATION
ASK! provides a SUBJECTIVE EVALUATION tool — a questionnaire. The surveyed results are computed and graphically illustrated. The program will then advise you on what it believes your apparent strengths and weaknesses are. Interesting stuff!

STAGE 2 — REVIEW OF ACCOUNTING PRINCIPLES
Numerous illustrations and spot tests are employed to ensure that each aspect is kept understandable and interesting.

STAGE 3 — RETURN ON INVESTMENT
Let the 6S ROI PYRAMID unravel the complex relationship between INCOME EARNING and ASSET MANAGEMENT. A fascinating analysis that helps you make a range of professional accounting adjustments to the figures to show the REAL PICTURE.

STAGE 4 — IN-DEPTH TREND ANALYSIS
A data-base is created. From this database a range of analyses is performed.

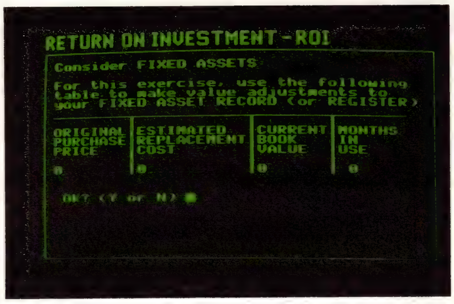
- OPERATING PERFORMANCE
- FINANCIAL POSITION, SHORT, MEDIUM, LONG TERMS, LIQUIDITY, PROFITABILITY.
- FINANCIAL MANAGEMENT, ASSET TURNOVER, ASSET DEPLOYMENT.
- BUDGETING & LIQUIDITY FORECASTS.

A user of ASK can not only see where he has been more clearly, but also is able to **plan with confidence** where he is going!

This is a program for Apple II, and Apple IIe computers.

All inclusive cost for the six diskette set, manual and protective folder — **$295.**

6S BUSINESS ADVISORY PTY LTD
P.O. BOX 1220,
GEELONG, VIC. 3220.
PHONE: (052) 22 4311.

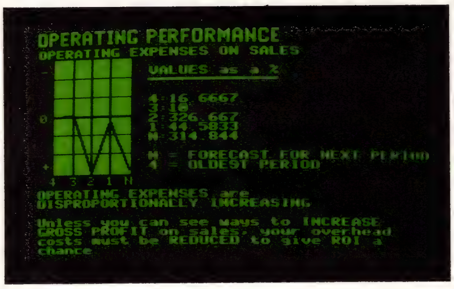

RETURN ON INVESTMENT - ROI

Consider FIXED ASSETS

For this exercise, use the following table to make value adjustments to your FIXED ASSET RECORD (or REGISTER)

ORIGINAL PURCHASE PRICE	ESTIMATED REPLACEMENT COST	CURRENT BOOK VALUE	MONTHS IN USE
0	0	0	0

OK? (Y or N)


OPERATING PERFORMANCE
OPERATING EXPENSES ON SALES

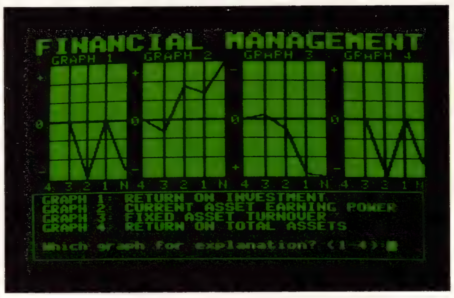
VALUES as a %

4 16.6667
3 10
2 326.667
1 44.5833
N 314.844

N = FORECAST FOR NEXT PERIOD
4 = OLDEST PERIOD

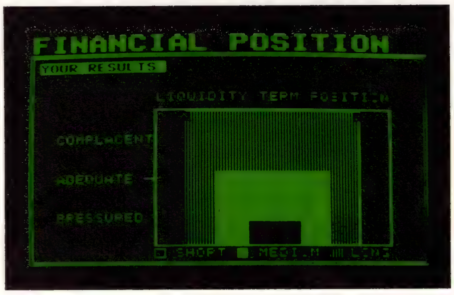
OPERATING EXPENSES are DISPROPORTIONALLY INCREASING

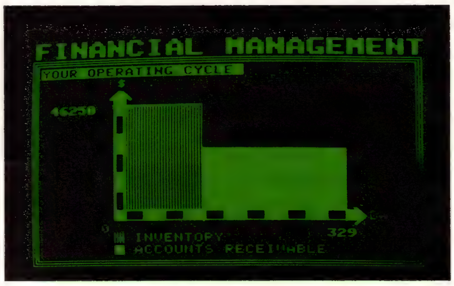
Unless you can see ways to INCREASE GROSS PROFIT on sales, your overhead costs must be REDUCED to give ROI a chance


FINANCIAL MANAGEMENT

GRAPH 1: RETURN ON INVESTMENT
GRAPH 2: CURRENT ASSET EARNING POWER
GRAPH 3: FIXED ASSET TURNOVER
GRAPH 4: RETURN ON TOTAL ASSETS

Which graph for explanation? (1-4)


FINANCIAL POSITION


FINANCIAL MANAGEMENT

Enter K068 on Enquiry Card

Designing statistical packages for micros

More and more data analysts will turn to micros as an alternative and adjunct to the use of statistical packages on mainframes. But, as RW Fitzgerald explains, the software should make full use of the micro's capabilities.

WITH the advent of true 16-bit and now 32-bit microcomputers which can sit on the data analyst's desk, much routine day-to-day analysis will be done using microcomputers or, as they're often called, personal computers. The mainframe computer will of course still have a major role to play but mainly as a large database management system.

There is no point in duplicating another SPSS or GLIM on microcomputers. It would be a waste of the unique capability the personal computer has — the enthralling one-to-one interactive relationship that the user forms with his or her microcomputer — and of the growing and enormous complexity of the graphics along with the sophisticated screen dump to hard copy printers that are becoming fairly standard.

The major reasons for using a microcomputer for statistical work are:

☐ The package is (or should be) user "affectionate" (as described by Dr A Miller, CSIRO DMS), in marked constrast to its mainframe cousins.

☐ Because of its ease of use it greatly speeds the preparation of interim reports.

☐ It can entice the novice computer and statistical user into its realm and hence remove load from the resident mainframe.

☐ It can expedite and encourage on-site validation and correction.

This article will attempt to achieve two things.

☐ To provide a brief review of some of the major characteristics of statistical packages available on microcomputers today.

☐ To relate some of the practical problems that Micro Stat Software has experienced in the development of BStat+ (a new basic statistical package) and u^2 SL (a mathematical Fortran 80, Basic 80 subroutine Library) for 8-bit Z80 microcomputers.

Statistical packages

In an article in *The American Statistician* of February 1983, Neffendorf lists some 29 statistical packages for microcomputers. To this list the author can add a further 10 packages which have appeared in a number of statistical and microcomputing journals since 1981. BMDP (running on a BMDP microcomputer at $US10,000), PStat, Genstat and Minitab are among these 10 packages.

The entrance of the more familiar mainframe packages on M68000 micro/mini computers will irrevocably alter the microcomputer statistical environment. However, many of these micro implementations of the mainframe packages have not taken advantage of many of the micro's unique features.

They tend to be direct translations of the original package which had its developmental feet firmly planted before the advent of the micro. They deserve to be treated as a separate group from the mainstream of statistical software for micros.

The mainstream tends to be one-off packages written by groups of statisticians and programmers who found an untrod virgin land with the advent of the micro. Hence, the arrival of the mainframe mafia (at a mafia price) is viewed with some irony — it was the mainframe mafia who some time back scorned the micros.

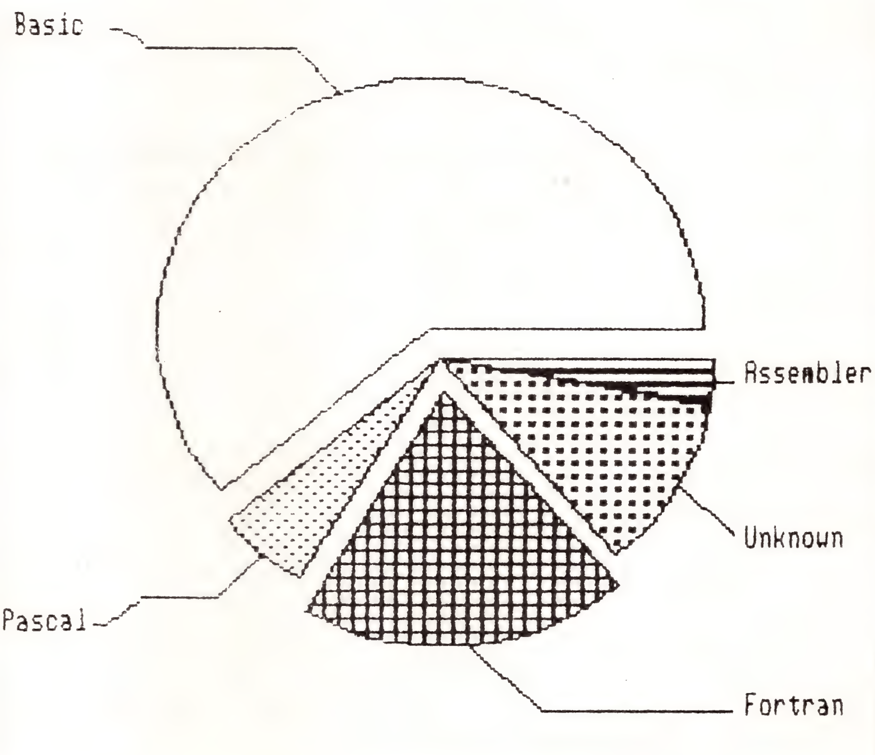


Figure 1: Languages used for statistical packages

The diversity and range of the packages reviewed raises three important issues:

☐ The *availability* of these statistical packages.
☐ The level of *user support* provided by the authors of the statistical package.
☐ The statistical and numerical *reliability* of these packages.

Micro-statistical packages tend to be like cars: they look good and powerful, but after some familiarity the lustre wears quickly.

Looking at the pricing of the mainstream statistical packages for microcomputers and exluding the top-end packages mentioned above, then the prices range from a low of $A50 through to a high of $A1870 with a mean of approximately $A460. This is a surprisingly reasonable price for the wide range of statistical utilities contained in these packages, provided that the above three criterion — availability, supportability and reliability — are present.

In purchasing a statistical package, it is important to consider not only price but also which machines the statistical package can run on. Will it run on the buyer's particular micro?

Encouragingly, of the packages looked at, some 39 per cent will run on CP/M systems, closely followed by 31 per cent for the Apple-DOS. The remainder of the packages are either specific to the TRS-80 (3 per cent), to the PET (3 per cent), other microcomputers, 16-bit micros (8 per cent) or will run on either an Apple, a Pet or a TRS-80 (17 per cent).

Most of the reviewed software originated in the United States, with 64 per cent, followed by the United Kingdom with 28 per cent, Australia with 6 per cent and Europe with only 2 per cent.

Micro Stat's BStat+

Micro Stat Software is working energetically to increase Australia's contribution to the world supply of statistical software.

We have come up with what we believe to be a world first for micros: u^2 SL, a Fortran 80 subroutine utility library for solving matrix inversions, transformations, determinants and Eigenvalue problems along with a wide range of statistical distributions.

Returning to the three points mentioned earlier, that is, availability, supportability and reliability, here in Australia only five major packages are available at present: Microstat, Statpack, Mass, SStatpac and BStat+, released from Micro Stat Software in September. Of these five packages, only two, BStat+ and Mass are Australian products and hence are supportable in Australia by the Australian developers.

As to the numerical and statistical reliability of these five packages, I can only comment at first hand on BStat+, which will include on the distribution disc a number of benchtest data sets to verify that the package is operating correctly on the host machine. These data sets have also been run through mainframe statistical packages.

BStat+ is designed to be a first-stage data analysis package — doing descriptive statistics and frequency analysis along with straightforward bivariate analysis, specifically correlation matrices, simple linear regression, cross tabulations and plotting — to give the analyst a "feel" for the data.

The real numerical and statistical problems begin to occur once you move into the areas of multivariate analysis — regression, discriminate analysis and analysis of variance. The problems encountered at the univariate and bivariate level are numerically well known and tractable.

Frequency table generation

The three most significant constraints upon the utility of the Z80 or 8080 based microcomputers on statistical and numerical data are:

☐ The speed of execution of the instruction set on these microprocessors and the ability of the particular language used to produce optimised code.
☐ The amount of core memory available to a running program which is generally limited to approximately 56000 8-bit bytes.
☐ The speed of the input/output to the floppy disk drives.

In designing a frequency table routine for inclusion in BStat+, a number of design considerations within the above three constraints were examined.

The straightforward algorithm for generating frequency tables is to allocate an array which contains at least as many elements as there are possible values and to use that value as a subscript to the storage array. This algorithm is executed quickly as the data itself is used directly to address the storage array. However, its major disadvantages are twofold:

☐ Knowing the upper limit of the value range.
☐ If there is not an even frequency spread across the possible range of values, then an enormous amount of core memory can be wasted.

To illustrate, with values 1-100, if most values are clustered from 1-10 and from 90-100 then all the cells from 11-89 are left empty which is a high overhead. With Fortran 80 on a Z80 micro, once a small-sized program has been loaded with all the overheads that are required of the original 56K there is generally only 32K of core memory left for any practical use, so empty cells are very valuable.

Let's examine the 32K of core left in a little more detail. In compiling frequency arrays one normally uses an integer array, which in Fortran 80 chews up 2 bytes per cell so that with roughly 32K of core available that allows for a maximum of 16,000 frequency cells. If, however, real numbers are used in the cells then each real number requires 4 bytes which only leaves 8000 cells for use. On the surface that looks quite reasonable.

Consider, however, that with a possible range of 1-100 and tabulating the actual frequency values as integers, this takes up 200 bytes. Also to store the actual values themselves, the total overhead for this simple one variable with a possible value range of 1-100 would require 600 bytes which in a 32K core machine only allows a maximum of 53 variables; not exactly staggeringly useful.

Consequently, the core limitations place considerable restraints on the sorts of algorithms which can be used to tabulate frequencies. For BStat+ we turned to the use of hashing algorithms and it is interesting to note that SPSS version 9 did the same. With a hashing algorithm the values of the data are hashed into an index number which is then used to look up a storage array.

The net result of a good hashing algorithm is that with our example above the amount of of core actually used would only be something like 20 cells. The algorithm is smart enough to recognise and keep track of the table which contains only the values so far found, not all possible values.

Plotting statistical data

In line with the current thinking in the literature and from our own experience, BStat+ along with a lot of the major statistical packages is emphasising the use of plotting facilities and graphics for the presentation of statistical results.

The single largest problem that a software developer faces in implementing VDU graphics on microcomputers is the incompatibility between terminal types, that is, the escape codes used to address the cursor as it flies around the screen.

BStat+ release 1 has taken the approach of device-independent hard copy printer plotting. The terminal graphics are device-independent. However, this particular limitation when combined with some of the newer innovations in grey tone pattern production, such as overprinting with specific combinations of characters, can produce some pleasant effects.

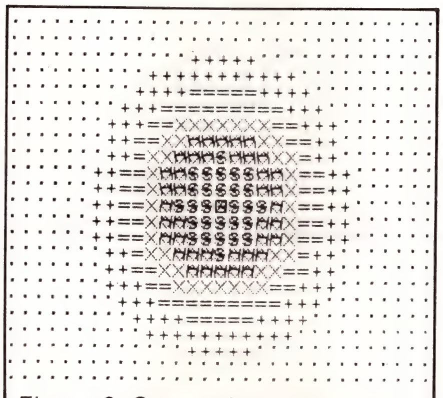


Figure 2: Seven shades of grey

Figure 2 is a plot of the bivariate normal probability density function with a rho=0 looking in plain view, that is, from above, using seven grey scales which are produced by judiciously overprinting particular characters.

Conclusion

The microcomputer, or as it will become better known, the personal computer, arrive on more and more data analyst's desks as an alternative and adjunct to the use of statistical packages on mainframe computers.

Provided the softare makes full use of the microcomputer's capacities, incorporates an affectionate attitude to the user and uses the best features of the newer computer languages, the quality and breadth of statistical and numerical analysis packages will increase substantially over the next few years. ☐

- *RW Fitzgerald operates Micro Stat Software. PO Box 125, Queanbeyan, NSW 2620.*

SOLVE ALL YOUR COMPUTER NEEDS NOW AT THE SOFTWARE CENTER

We offer the widest possible range of word-processing, financial models, data management and accounting programmes, educational games, utilities, plus the option of renting Business software for evaluation purposes.
See our selection of books, magazines, mailing labels, computer papers, printed forms, diskettes, disk drive cleaner kits etc.

SOFTWARE CENTER
Shop 8, Cremorne Arcade
576 Hay Street, Perth 6000. Tel: 325 8471

SEND FOR YOUR FREE CATALOGUE

SOFTWARE CENTER
Shop 8, Cremorne Arcade, 576 Hay Street, Perth 6000. Tel: 325 8471

Please send me more information on:
☐Word-processing ☐financial models ☐data management
☐accounting programmes ☐educational games ☐utilities,
☐the option of renting Business Software for evaluating purposes.

MAKE OF COMPUTER ....
NAME ....
ADDRESS ....
TEL ....

SC/MC-1

Enter K065 on Enquiry Card

Avoid the shocks

The office environment can present nasty threats from temperature, dust, static electricity and power surges.

David Angeloro

TELEVISION advertisements show personal computers being carried into the office and simply installed within minutes. This implies that the personal computer requires no special installation to be productive in a normal office environment. This attitude is supported by the manufacturers and suppliers who wish to maintain the "child's play" image of personal computers.

However, this image is not completely accurate. Experience has shown that proper consideration for the personal computer's physical environment may avoid frustrating downtime and the aggravating loss of important data and processing. In addition, costly equipment maintenance can be significantly reduced.

There is no doubt that personal computers were designed to operate in normal office conditions and do not require special computer rooms.

However, special attention may be required in some offices to ensure power requirements, static electricity, temperature control, dust control and noise suppression are adequate.

Power requirements

Normal office power points will provide the correct voltage (240 volts), frequency (50) cycles and amperage for the operation of personal computers. A standard three-point plug is fitted to personal computers within Australia, even though occasionally equipment will still require American two-point plugs where power to the screen and peripherals is provided from the personal computer chassis.

A typical personal computer installation requires two to four power points (one each for the micro processor, visual display screen, printer, and fixed disk storage device). A typical office usually has insufficient power points to accommodate even a small number of personal computers without using double adapters and other such devices that may overload the power point and produce a fire hazard.

When installing additional power points, the installation of a clean line should be considered. A clean line is a power line from the main circuit box on which only the personal computers, visual display screens and data storage devices will be connected. Visual display units communicating with a large computer may also share this line.

The use of a clean line will considerably reduce the occurrence of power interference caused by equipment with electric motors (typewriters, photocopiers, printers, etc), transformers (fluorescent lighting, etc), and heating elements (electric jugs, coffee makers, heaters, etc). Power interference produced by an electric jug may be sufficient to cause a personal computer to fail, losing the data and processing that is being utilised.

It may surprise some personal computer users that their power supply may be a series of overvoltages, undervoltages, and noise. Overvoltages are the supply of more than the nominal 240 volts, while undervoltages are the supply of less than 240 volts. Noise is when the supply of electricity is not provided as a smooth signal, but an inconsistent signal made up of many fluctuations.

Overvoltages, undervoltages, and noise are common. Industrial areas and large buildings are particularly prone to power fluctuations that may require special attention.

Overvoltage not only can cause the loss of data and processing, but may damage the personal computer's electronic components. Most personal computers have circuitry to block normal power overvoltages, but it may be inadequate to stop all cases where damage may occur.

Special power line conditioners, line filters, and surge suppressors are available and may need to be considered. These devices cost from as little as $35 for an inexpensive surge suppressor to hundreds of dollars for more sophisticated models. This may be a small price compared with the cost of the personal computer downtime and repair of damaged components.

Static electricity

Static electricity is a form of power overvoltage that comes from the personal computer's environment, instead of through the power line. It can cause processing faults, loss of data and damage to the personal computer equipment.

Everyone is familiar with the shock from static electricity as it discharges from the hand when touching a metal object, or the visible spark from the movement of a blanket at night. These manifestations can have a major impact on the operation of a personal computer.

Static electricity is considered to be one of the major causes of personal computer equipment failure. Severe damage to the personal computer's electronic components can be caused by amounts of static electricity that can be collected through normal office activities.

Vulnerability of electronic devices

	Volts
CMOS	250 to 3000
EPROM	100 to
Film Resistors	300 to 3000
GaAsFET	100 to 200
FTET	140 to 7000
MOSFET	100 to 200
OP AMP	190 to 2500
Schottky Diode	300 to 2500
SCR	680 to 1000
VMOS	30 to 1800

A person walking across the office may collect 2000 to 35,000 volts on a carpeted floor or 400 to 12,000 volts on a vinyl floor. This is more than enough to damage the micro circuitry of personal computers.

Many personal computers are adequately grounded to protect their internal circuitry. However, the electronic components are at risk whenever the protective cover is removed to insert new option boards or to repair faults.

A good practice is to minimise any contact with the personal computer's internals and always to ground oneself (by touching the turned off internal power supply) before touching any of the components.

Static electricity may also corrupt data on data storage media (floppy disk, cassette, hard disk, etc) when discharged through the media. Care should be taken when handling data storage media and particular attention should be given to data storage media that is going to be mailed or transported between locations.

In offices where static electricity poses a potential problem, antistatic measures should be considered. Companies provide antistatic mats, sprays to neutralise carpets, and antistatic repair kits.

Noise suppression

A personal computer with audible key contact, sound-effects, or a printer may produce noise that is unacceptable in a normal office. This is especially true where direct or telephone contact exists with customers.

The location of the printer must be carefully planned. Locating the printer in a separate room or the use of an accoustic hood should be considered to reduce the noise level within the general office.

The placement of acoustic partitions may also assist in noise reduction where the personal computer produces noises that are distracting to the other office workers.

Temperature control

Personal computers will operate within a normal air-conditioned office. However, their operation in extreme heat (30°C) or cold (5°C) may lead to questionable processing results or damage to components.

Temperature control in most offices can be handled through commonsense. Personal computers and data storage media should not be located in direct sunlight since the radiated heat can produce extreme heat at the contact surface.

Air vents around the personal computer should always be free of obstructions to maintain adequate airflow around components.

Many personal computers do not have internal fans and in these cases the addition of a fan should be considered to increase the airflow around the electronic components.

Additional air conditioning may be required where a large number of personal computers are going to be installed. Most buildings have been constructed to accommodate a normal number of people, lighting, and office equipment. Some personal computers generate the equivalent heat of three people, and when this is multiplied by a number of personal computers it may be sufficient to overload the air conditioning.

Dust control

Dust is a potential hazard to the personal computer's keyboard, internal electronic components and data storage device's read-write heads.

Dust collected under the keyboard can reduce or prevent accurate key contact. Dust among the circuit boards may cause a short circuit. Dust on the read-write head may cause input-output errors and damage to the data storage media.

The removal of the dust or repair of damaged components can be costly. Dust covers should be provided for the personal computer, its keyboard, and data storage devices. These dust covers should be placed over the equipment at night or any time the device is not going to be used for long periods.

Surprisingly, unlike typewriters, dust covers are seldom required of personal computers. There are several commercially available dust covers, or they can quite easily be produced.

Conclusion

Even though the personal computers have been designed to operate within a normal office environment, there is a need to plan their installation. A small amount of planning and prevention will pay back considerable results in reducing down-time and costly maintenance.

This improvement to the personal computer's operation will in turn improve its performance and increase staff acceptance of its use within the office. □

• David Angeloro is consulting director of David Angeloro & Associates Pty Ltd and a Certified Information System Auditor (EDP Auditors Foundation, USA).

WILDCAT COMPUTERS
& SOFTWARE SALES

2/150 CRONULLA ST, CRONULLA
PHONE: (02) 523 3505

BUSINESS & COMPUTER
CONSULTANTS

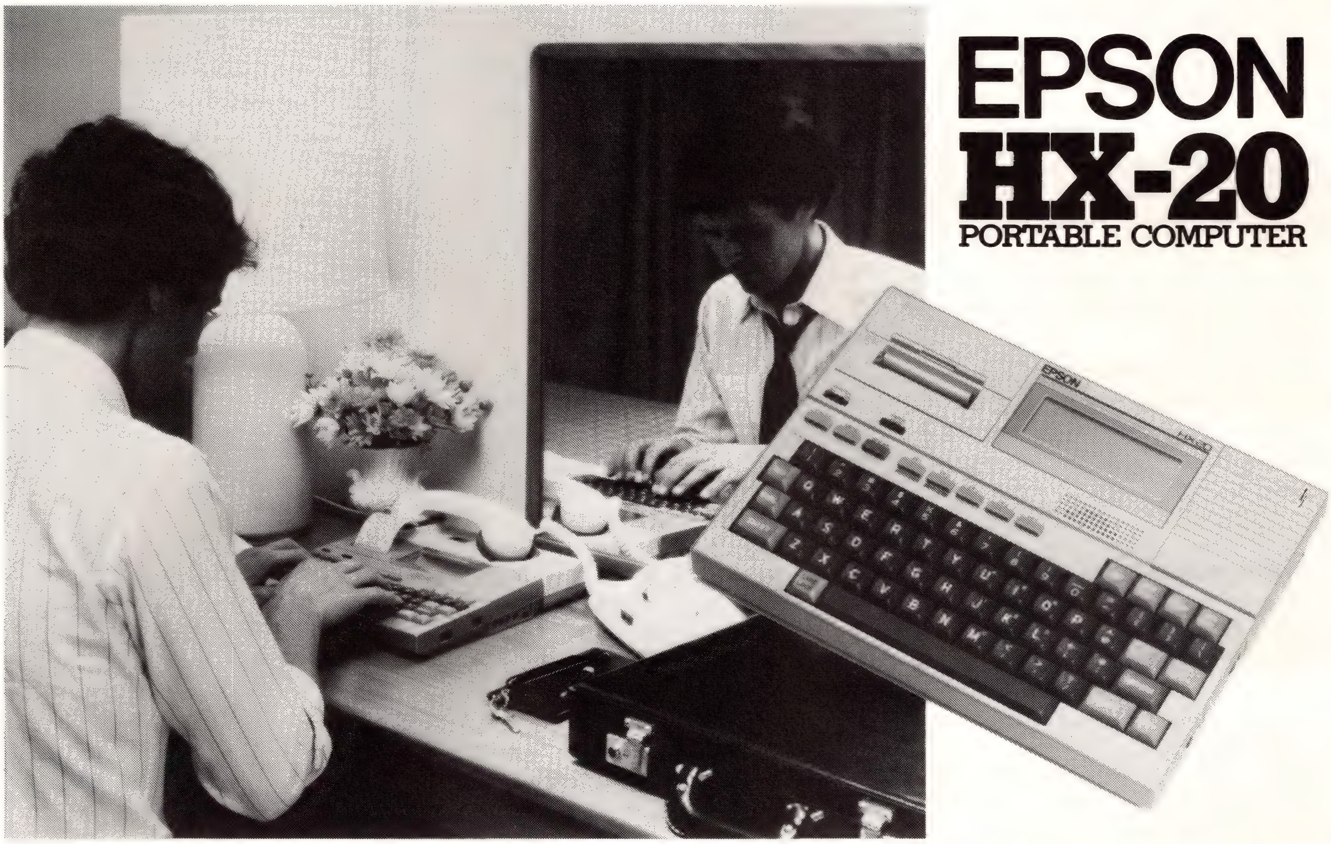
SYSTEMS: Word Processing;
General Accounting;
Video Library;
Real Estate; etc.
from: $3,450

COMPUTERS:
Sigma/Oki
NEC PC 8000
HITACHI — MB 6809
— 16000

VERBATIM DISKETTES
5¼" DOUBLE DENSITY SINGLE SIDED $40.00 BOX OF 10
5¼" DOUBLE DENSITY DOUBLE SIDED $50.00 BOX of 10

Enter K554 on Enquiry Card

The portable computer you can take anywhere, use anytime.



EPSON
HX-20
PORTABLE COMPUTER

Little computer, big power.

The world has been waiting for the full-function, truly portable computer. One that's a real computer, not a glorified calculator.

Epson's HX-20 is that computer. Its standard 16KB RAM memory is expandable to 32KB. And the standard 32KB ROM memory can be upped to 72KB if you choose.

But this tremendous power is not all there is to HX-20. It also communicates. With RS-232C and serial interfaces for connection to telephone couplers and other devices.

HX-20 is easy to use, too. The full-size ASCII keyboard works just like your favourite typewriter.

Add a built-in printer, LCD screen and music generation via a piezo-electric speaker and you have versatility the likes of which have never before been found in a computer this small.

What's more, the HX-20 works on a full, extended version of Microsoft BASIC. And it has time and date functions.

Optional microcassette and ROM cartridges are available.

Goes wherever you go.

With this computer, you can compute, not just crunch numbers. You can write programs, and you can manipulate them - anywhere. Because the HX-20 utilizes rechargeable nickel-cadmium batteries and low-power, all CMOS memory to keep the computer up and running for as long as 40 hours at a stretch.

So compute what you need on the road. Then dump it all onto a cartridge, or into your main system when you get back. What could be simpler?

And you don't have to worry when you turn the HX-20 off. It maintains a low-voltage current to keep everything you've put in the memory safe.

For further information contact your local authorised Epson dealer or Warburton Franki office.

WARBURTON FRANKI

● ADELAIDE (08) 356-7333 ● BRISBANE (07) 52-7255 ● HOBART (002) 28-0321 ● MELBOURNE (03) 699-4999
● PERTH (09) 277-7000 ● SYDNEY (02) 648-1711

WF892/81

Enter K063 on Enquiry Card

Innovators in Winchester Subsystems!
Tallgrass Technologies
Cartridge Tape/HardFile System
12 + 20 Mb
Tallgrass Technologies Corporation
Guide to Operations
IBM

TALLGRASS AND YOUR IBM® PC

Tallgrass Technologies is the industry leader in Winchester HardFile™ and streaming tape subsystems for the IBM® PC and related computers. Major corporations, banks, governmental agencies and small businesses throughout the world depend on Tallgrass HardFile subsystems for their mass storage and backup requirements.

Tallgrass offers formatted capacities from 6.25Mb to 70Mb with integral streaming tape backup.

Our proprietary disk/tape controller with integral 10K track buffer optimizes read/write activity and coupled with DMA host interface, offers high performance previously unavailable with 5¼″ disk systems.

WHAT ABOUT DATA INTEGRITY?

Tallgrass offers backup on ANSI standard ¼″ tape cartridges, instead of the usual floppies, video cassettes, or low-capacity removable Winchester devices. The Tallgrass 12.5Mb formatted HardFile can back itself up on an economical data cartridge in less than 10 minutes.

All Tallgrass HardFiles are equipped with a dedicated landing Zone where the read/write heads land. This protects against incidental damage and data loss during power-downs and transportation.

TALLGRASS IS UNSURPASSED

We've done our homework in engineering and building a reliable HardFile subsystem with remarkable performance and convenient backup for the most stringent on-line mass storage and off-line archival requirements.

From $4,506 including integral tape backup and available now from selected computer retailers.

For further information call

Tallgrass Technologies Australia Pty. Limited
Suite 12, Five Dock Plaza
50 Great North Rd., Five Dock, N.S.W. 2046
(02) 712 2010/712 2003

Tallgrass Technologies
Australia

Now in Australia

Call for Papers

MICROCOMPUTER TECHNOLOGY

Developments in microcomputer technology over the last five years have resulted in the proliferation of microcomputers into all facets of human existence eg. in business, education and the home. The microcomputer has had a considerable impact on society and it is becoming more evident that there will be an increasing dependence on them in the future.

The Organizing Committee for the International Microcomputer Conference invites submissions from potential authors of papers covering topics which will support the broad conference theme of present and future application of microcomputers in business, education and the home.

Contributed papers are a major feature of the conference. The following are examples of possible topics:

- applications of spreadsheets
- microcomputer solutions
- microcomputers as peripherals
- microcomputers in the home
- problems experienced by first time users
- graphics
- security and control
- microcomputers in education
- networks and databases
- non-commercial applications

Authors intending to submit a paper should return a 400 word abstract on the proposed paper.

Each draft paper submitted will be refereed as part of the selection process. The criteria for selection will be clarity, originality, relevance to the theme and suitability for oral presentation.

It is the intention to select suitable papers for publication in a book.

ABSTRACT DEADLINE October 21, 1983

For further information write to Business Systems Centre, Western Australian Institute of Technology, Kent Street, Bentley, Western Australia, 6102 or telephone (09) 350-7717.

1984 INTERNATIONAL MICROCOMPUTER CONFERENCE

Venue: Western Australian Institute of Technology, Perth 22-24 May 1984.

Business Systems
Centre

WAIT
Western Australian
Institute of Technology

Enter K041 on Enquiry Card

KAYPRO II
THE PORTABLE COMPUTER

COLUMBIA
16-BIT POWER

SIERRA DATA SCIENCES
MULTI-USER
SYSTEMS TURBO DOS OR MP/M

FRANKLIN ACE 1200
RUNS ALL APPLE SOFTWARE, 64K, CP/M & DOS, 2 DISKS, 40 OR 80 COLUMN DISPLAY, COLOR GRAPHICS SERIAL + PARALLEL I/FACE NUMERIC KEYPAD

PRINTERS FACIT / C.ITOH / MICROLINE / AMUST / OLYMPIA

- VERBATIM diskettes
- Acrylic library boxes for 40, 50 or 90 floppies.
- **ANGEL** — Intelligent print buffer.
- SOFTWARE — See below for a small selection of our range.

* = demo available for hire.

Data Base	Word Handlers	Spread Sheets	Communications	Languages	Miscellaneous
GBS	BENCHMARK	CALCSTAR	BSTAM	ADA	BADLIM
CARDBOX	EDIT 80	FPL III	BSTMS	MBASIC	COMPRESS
CARDFILE	GRAMMATIK	MINI MODEL *	CROSSTALK	NEVADA COBOL	CP+
CITATION	LETTERIGHT	MULTIPLAN	HITE	C	DESPOOL
CONDOR *	MINCE	PLAN80 *	MCALL	CB-80	DIAGNOSTICS II
DATASTAR	PALANTIR	PLANFIN	MICRO LINK	CBASIC-2	DISK DOCTOR
dBASE II *	PERFECT WRITER	PLANNERCALC	MOVE-IT	CIS COBOL	FABS
FMS-80	PROOFREADER	SCRATCHPAD	REFORMATTER	COBOL 80	FILEFIX
SELECTOR V *	SCRIBBLE	SUPERCALC		COMPAS PASCAL	FORMS-2
SUPERFILE	SELECT	T/MAKER 2	Critical Path	S/SOFT FORTH	LYNX
THE QUAD	SPELLBINDER	TARGET	------------------	FORTH 79	MICRO B+
WHATSIT	SPELLGUARD *	BOTTOM LINE	MILESTONE *	FORTRAN 80	PEARL
DATA-VIEW	SUPERWRITER	PERFECT CALC	PMS II *	PASCAL MT+	QUIC-N-EASI *
ANALYST	TEXTWRITER III			SBASIC	THE SENSIBLE SOLUTION
PERFECT FILER	WORDSTAR *			PL1/80	QUICKCODE
					THE LAST ONE

CYCOM COMPUTER SYSTEMS PTY. LTD.
178 HIGH STREET, WINDSOR 3181. Telephone (03) 529 3029.

APPLE is registered Trademark of Apple Computer Inc. CP/M and MP/M are registered Trademarks of Digital Research. TURBODOS is registered Trademark of Software 2000.

Enter K042 on Enquiry Card

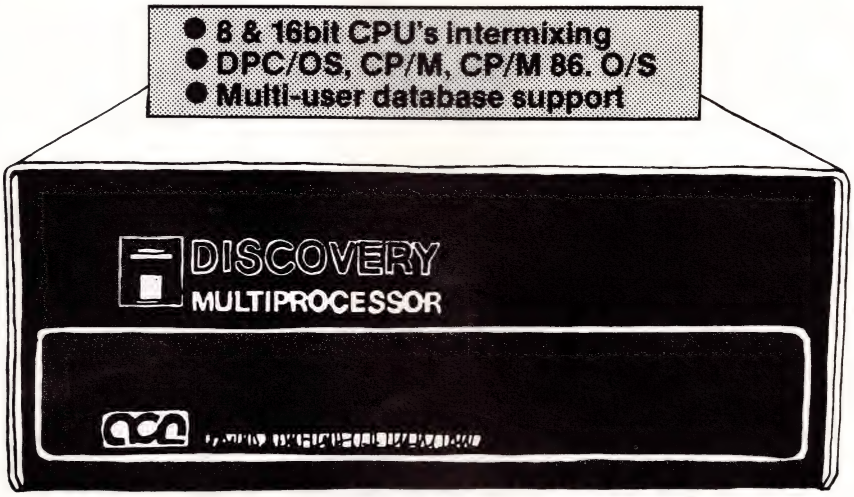
Discovery

the computer with a clear growth path.

The Discovery Multi-Processor is designed to grow as you grow, from 1 user to 16 without missing a beat.

Each user is equipped with their own microprocessor and RAM ensuring a speed of access unequalled by most minicomputer installations.

Why pay minicomputer prices when the Discovery has the power and flexibility to do a better job at half the price? And it offers true multi-processing, running both 8 and 16bit processors in any combination.



- ● 8 & 16bit CPU's intermixing
- ● DPC/OS, CP/M, CP/M 86. O/S
- ● Multi-user database support

Discovery. The sky's no limit.

Only available from:

Archives Computers Australia Pty. Ltd.,

163 Clarendon Street,
South Melbourne 3205.
Tel. (03) 699 8377
Telex AA39388 ARC 475 A

16th Floor, 55 Lavender Street,
Milsons Point 2061.
Tel. (02) 922 3188
And interstate dealers

Stand No. 159
10ACC

Enter K046 on Enquiry Card

The perfect solution.

If you demand reliability and expansion capability, then the QDP-300 is the perfect solution. The advanced QDP-300 microcomputer utilizes the CP/M or MP/M operating systems that allow you tremendous flexibility in software applications including word processing, financial forecasting, industry and production control, payroll and more. And the QDP-300 is user friendly...with an on-line "Help" system to give even untrained operators access to its full power. This, plus the one year warranty makes the QDP-300 computer the perfect solution.

QDP Features:

- IEEE 696/S-100 BUS
- Unique cache memory disk buffering for high speed system throughput
- 8" double-sided, double-density disk drives
- Up to 15 MB internal hard disk system available
- Easy, low-cost expansion to four users
- Z80B CPU operating at 6 MHz (no wait states)
- 16 bit upgradeable
- Large library of CP/M commercial and specialised software available

QDP
computer systems, inc.

Now...you get six outstanding software programs at no additional cost included with every QDP-300 computer with CP/M.

- QDP "Help Program"
- QDP "Menu Program"

As well as the following Perfect Software™ programs...

- Perfect Writer™
  The revolutionary word processing program with multiple-file, split-screen editing.
- Perfect Speller™
  The in-context spelling checker with a 50,000 word dictionary.
- Perfect Filer™
  The versatile records management tool for mailing lists, labels, invoices, checks, forms and reports.
- Perfect Calc™
  The most powerful spreadsheet program: seven worksheets on-line, user-defined functions, split screen, 17 built-in applications programs.

Call or write for complete specifications and literature.

insystems

INSYSTEMS PTY LTD

337 Moray Street,
South Melbourne, 3205.
Phone (03) 690 2899
Telex AA 30458.

84 Pacific Highway,
St. Leonards, 2065
Phone (02) 439 3788

Specifications subject to change. CP/M and MP/M are trademarks of Digital Research Corp; Perfect Software, Perfect Writer, Perfect Speller, Perfect Filer, Perfect Calc, are registered trademarks of Perfect Software.

Exclusive Australasian distributor

If you are not using the daisywriter® letter quality printer look what you are missing . . .

- **INTERNAL 48Kb BUFFER MEMORY** — the printer holds up to 30 pages of text which frees up the processor to do other tasks
- **UNIVERSAL INTERFACE** — from Apple to Xerox and Commodore through IBM-PC to TRS-80. Daisywriter will connect to any procesor with RS232, Centronics, IEEE or current loop interfaces.
- **COMPLETE RANGE OF PROTOCOLS** — from Apple soft to Zardax and Multiplan to Visicalc. Daisywriter will run with virtually any software.
- **HIGH SPEED PRINT THROUGHPUT** — bi-directional printing with high speed logic seeking ability which enables Daisywriter to ZIP over white space on the page at up to 200 cps.
- **HIGH RELIABILITY** — runs on a linear motor — no belts, pulleys or wheels to wear and require adjustment.
- **LOW RUNING COST** — uses easily loaded daisywheel cassettes and standard IBM typewriter ribbon cartridge.
- **GRAPHICS** — full graphics capability.
- **INTERNAL SOFTWARE COMMANDS** — more than 75 software commands to give you true proportional spacing and speed up your word processing.
- **CUTSHEET AND TRACTOR FEEDERS** — available as options.
- **LOW PRICE** — for **$1986*** you get — the most **powerful**, most **reliable**, most **cost effective** letter quality printer in the world.

* Price excluding sales tax.

PSI **PAPERWORK SYSTEMS INC.** *(GROUP) PTY. LTD.*

Incorporated in N.S.W.

HEAD OFFICE 14th FLOOR, 124 WALKER ST. (P.O. BOX 351) NORTH SYDNEY N.S.W. 2060. AUSTRALIA. PH (02) 922 5322 TELEX: AA23981
3 BOWEN CRESCENT, MELBOURNE VICTORIA 3004. AUSTRALIA. TELEPHONE: (03) 267 7555

Enter K076 on Enquiry Card

Been down so long, it looks like

August provided an insight into the broad face of computer education in NSW. Ian Webster was there.

AUGUST was a busy month for computer educators in NSW, starting with the annual NSW Computer Education Group conference, Information Technology Week, the education departments' policy document, opening of the Computer Education Unit and signs later in the month that a wide ranging discussion of the place of computers in education may be about to emerge.

The NSWCEG conference in the Blue Mountains, attended by over four hundred educators, including a sprinkling of interstate visitors, was an important barometer of the attitude of teachers using computers in schools.

Few people outside of NSW understand the extent the local NSW teachers have pursued their interest in computers and it always comes as a surprise to interstate visitors, that despite their preconceptions about systemic activity, NSW has probably the highest installed base of machines per school and an enthusiastic, innovative group of teachers. This is the importance of the NSW experience, anarchic as it may be, it's a clear illustration of the strengths and weaknesses of school-based development.

From with the Minister's opening address, calling for people to stop knocking his department, and later with Barry Smith's address to the conference, the mood of the conference was restless. NSW teachers cynicism towards Education Department bureaucracy is based on their frustration and anger at the poor support they receive.

For many teachers these two speeches were the first time that they had heard anything about the policy initiatives and activities of the department. Throughout Barry Smith's speech about the future direction of departmental policy there was a growing restlessness because of the poor fit between the practical concerns of teachers and policy.

Many of the workshops at the conference spent the next two days trying to draft responses that expressed their frustration at the lack of awareness of teachers needs and concerns.

The two areas of greatest concern were software development, with teachers rejecting the policy position that the department should not commit resources to software development but would pursue the naive policy of evaluating and distributing software from unnamed sources, and the low priority of computers for the administration and management of resources.

The impact of computers on the management of information resources on any organisation is a key area and the continued refusal of systemic administrators to consider this as part of computer education, because of the enormous impact it will have on the bureaucratic structures of the education system will be a continuing area of agitation and contention by teachers. Perhaps the most encouraging aspect of the conference was the number and interest of senior teachers. These

The Shears/Dale Report

Computers in Education is a report from the Victorian office of the Coordinator of Education, prepared by Dr Lawrie Shears and Lee Dale. The report is based on information from systemic educators in Germany, Norway, France, UK, USA, Canada, Japan, China, Thailand and Yugoslavia as well as all states of Australia.

The report presents an overview, analysis and summary of the material followed by 20 recommendations. It is an important document and although it has been well received by the education establishment, with the first printing of 2000 copies almost exhausted, computer educators have commented that the report is out of touch with the practical realities of computer education in schools.

This is the importance of the report, as it presents for the first time a coherent statement on systemic attitudes to computer education in Australia. The bibliography for the chapter on Australia is a definitive record of the development of the systemic debate about the use of computers in schools.

Few people using computers in education have read many of these papers, an indication of the very small and select group of people who have been involved in the development of this discussion.

Dr Shears' attempt to support the new orthodoxy in Australian computer education, that systemic policy development is the key to success, is unsubstantiated and not convincing.

The reports enthusiasm for teacher training "if teachers, as a whole, are not persuaded that the use of the technology" is in complete contrast to the failure of most education systems to provide any literacy training for their own administrative, management and support staff.

Chapter three of the report illustrates the dilemma faced by systemic administrators with their refusal to consider the major structural effects of computer-based technology on education systems. An attempt to provide a rationale for the place of computers in education, based on the classroom model, slips and slides around a few general observations about the world in which we seem to live, then moves quickly on to the firmer ground of categorising types of computer activity.

Dr Shears adopts the use of the word "familiarisation" rather than computer literacy or awareness, an important choice that illustrates the technocratic pretentions typical of many systemic administrators, who come from systems with little direct experience in the use of the technology.

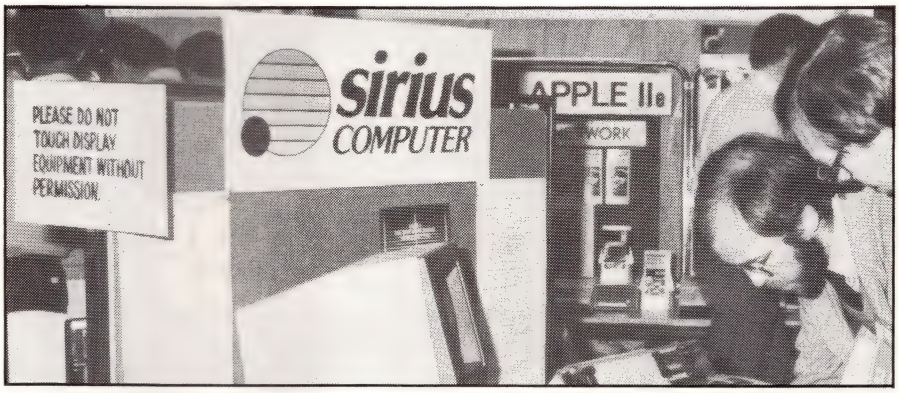
The refusal of systemic educators to allow that, like all organisations, the effects of computer-based technology on the management and administration

up to me.

teachers are a powerful lobby group with good connections, particularly at regional level and within the Inspectorate and should be able to agitate successfully for the interests of teachers.

Barry Jones opened Information Technology Week at the Power House Museum with a delightful speech, as usual, irritating the computer industry who feel that his version of high technology doesn't really include them, declaring himself a "passionate sceptic" about the capacity of the industry to steer itself around 1984. The industry's perception is based on its apparent feeling that computer manufacture is similar to the motor-vehicle industry. Barry Jones considers brainpower as the essential basis for the development of high-technology industries.

Information Technology Week, despite some enthuiastically received events and displays, continues to escape the interest of the general public. People interested in community awareness should study computer month in Victoria, orchestrated by the indefatigable Sandra Wills, during September.


PLEASE DO NOT TOUCH DISPLAY EQUIPMENT WITHOUT PERMISSION
sirius
COMPUTER
APPLE IIe
WORK

The continuing suspicion of community interest in computers by the data-processing profession and many suppliers was illustrated by the Educomp '83 exhibition organised by the parents association of Mosman High School. The three-day exhibition was well attended but the occasional "Please do not touch equipment" and the formalised and packaged approach of many suppliers to the education market only contributes to a mystification of the technology.

The highlight of Educare '83 was the performance of prominent educationist Professor Lachlan Chipman, who proclaimed to the television cameras "When the computers are as good as the teachers, what will happen to teachers, then?"

The Monday after ITW, the NSW Minister for Education, unveiled a small granite plaque at the opening of the Computer Education Unit and released the Department's policy statement on computers in schools. The large attendance of departmental bureaucrats at the opening indicates the importance attached to this fashionable area and reinforces the view that they see it as having a major impact of the distribution of power and resources at the bureaucratic level of the system. Recently, several committee appointments, in particular to the technical working party of the schools commission inquiry emphasise the importance they place on the control of influence and information.

The policy statement, virtually a reorganisation of discussion guidelines released last year, was well received and is a tribute to the efforts of Barry Smith to push the department into a broad statement of policy that provides space to move away from a preoccupation with the computer.

He now has to build the infrastructure to implement the policy. It will not be easy as the departments enthusiasm for inservicing teachers has not been matched by programs for the professional development of the inservicers, specialist staff or consultants. The low level of technical skill and experience of most of the Unit's consultants is the legacy of years of neglect by services and studies management.

Bill Marwood, perhaps more responsible for the origins of the style of NSW computer education than anyone else, made a rare public appearance at the opening of the Unit.

Bill Marwood, an officer with the Policy Support Unit, is one of the few people in the department with any formal qualifications in computing. Throughout the late '70s his opinions, based on the lack of appropriate hardware, opposition to the teaching of programming in schools and perception of the lack of community pressure for computers in schools formed the basis for policy.

He is best remembered for his convictions about the pre-eminence of NSW with regard to computer education policy. His paper to a bemused seminar of interstate computer educators in 1977 was largely responsible for the maverick image that NSW has had and is just starting to change as other states appreciate the importance of the NSW experience.

The Victorian department released the Shears/Dale report in the middle of the month followed by the finalising of the activities of the Schools Commission working parties.

In NSW members of the Schools Commission National Advisory com-

of information and resources within the organisation are the central issues rather than attempting to legitimise or appropriate the technology means that adhoc personal activity will continue to dominate, despite attempts to develop and implement systemic policy.

Dr Shears appears puzzled by the attitude of the Japanese towards computer education, proposing cultural differences as the reason for their lack of interest in systemic computer education. Perhaps a closer personal acquaintance with the technology might enlighten Dr Shears.

Anyone interested in Australian computer education should read this report, although it would have benefitted by the inclusion of an addenda similar to John Burke's severe critique of the assumptions behind the Commonwealth Government's mid '70s report "Computers and Teaching". The report will reinforce computer educators' feelings that computer education is much to important to be left to the systemic administrators.

If you want to get Computer wise, we'll take it personally.

Personal Computers are the thing at 'Computerwise'. Our huge display centre is brimming with great home computer ideas. And if this is your first time, we have a fully equiped 'Education Centre' to help you get the most out of your personal computer.

Our Display Centre is a revolution in computers in WA. See us and see the full range of computers and options at Computerwise.

See the Computerwise professional staff. And see this full range of equipment...

- **COMMODORE**
- **APPLE**
- **SPECTRAVIDEO**
- **SIRIUS**
- **ICL**
- **MOLECULAR**
- **HYPERION**
- **SHARP**
- **MICROLINE**

FREE!
Special lesson-course with every personal computer sold.

Education on-going, for you and your family.

COMPUTERWISE

Cnr Albany Highway and Willis Street's East Victoria Park. Tel: (09) 362 6999.

Enter K083 on Enquiry Card

mittee met with computer educators for the first time and while they appeared interested it appears that the constituency interests that they directly represent will be the major influences on their attitudes.

The IBBY conference on the electronic book, the influential success of the movie Wargames and Prof. Tom Stonier talking with his quiet optimism on the Don Lane Show about computers as grandmothers indicate the extraordinary community interest in the computer and its works.

Much of the work of computer education pioneers like Papert, Bork and Suppes has been based on a desire to find new ways of teaching people, that are not constrained by the continuing crisis in our education systems. They often regard the cooption of the technology and the enthusiasm of education systems for the classroom based use of computers with tolerance, but are aware of the "trojan horse" nature of the technology.

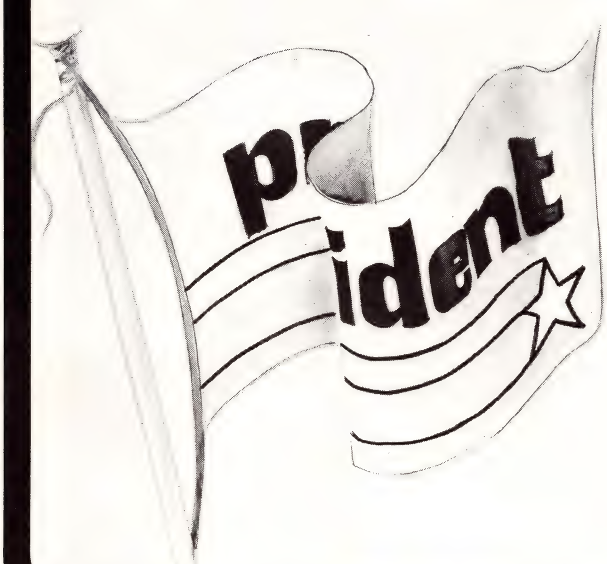
West Australian Professor, Michael Scriven, was embarrassed late in the month by several remarks attributed to him by "The Australian", that he saw computers as a replacement for less able teachers. Professor Scriven's opinions reflect a more considered view of the systemic impact of computers than the Dr Strangelove approach at Educare '83.

He uses the term "Curriculum compression" to describe the impact of computers on curriculum an offers some insights into the enormous impact the technology will have on education systems.

The draft computer education policies of the Australian Teachers Federation and the NSW Teachers Federation reflect these concerns with the equality of opportunity, adequate resource fundg and the industrial issues that will affect teachers.

As Alfred Bork says "It is not clear whether computers will lead to a better or worse educational system than we have today. I am predicting that the future of education is a desirable one. The changes for an undesirable future are frightening".

In NSW effective computer education programs will continue to escape the education system as management refuses to confront the impact of the technology on the system itself. ☐



After extensive research into the best this world can offer, President is proud to present to fellow Australians what we believe to be the top range of computer systems available on the market today.
Just have a look over the next four pages - we're sure you will agree.

president

KAYPRO II

ANYTIME. ANYWHERE.

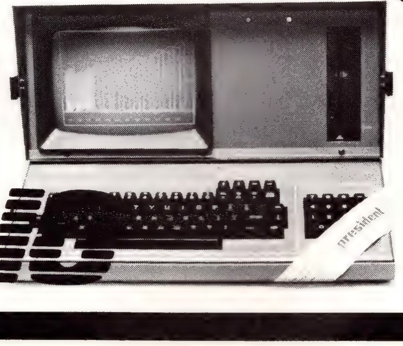
Easy is the most apt description for this model – easily portable, affordable, readable and typeable: Sculptured, high-quality keyboard, and weighing just 13 kilos. A free range of software to the value of $2,500 is included.
The Kaypro is CPM-DOS compatible and driven by a ZILOG Z-80™ microprocessor, making it a most popular system for the small business-person.

$3,295
(inc. tax)

SUPER POWER

An innovative combination of 10 megabytes of power with perfect portability is what this computer is all about. The hard disk CPM-DOS™ compatible system is suitable for word processing, professional and personal use. Features graphic display and the full range of "ready to go" Kaypro software. What a package!

$6,215
(inc. tax)



KAYPRO 10

Enter K052 on Enquiry Card

Enter K047 on Enquiry Card

president GROUP

SETTING THE STANDARD

The world's most advanced, most powerful, most compact, portable computer.

DULMONT MAGNUM

Guess where it's made?

If your guess was Japan or perhaps America, you're quite wrong.

The Dulmont Magnum was designed and manufactured right here in Australia.

To offer businessmen and women something unavailable in the world.

Truly powerful, comprehensive and efficient computing in a portable package.

The complete unit will fit inside an average briefcase, yet boasts 16 bits of power, up to 265k of battery packed memory, up to 128k of resident software, and a full sized keyboard.

Whilst a range of peripherals are available for most applications.

In short, portable computers have now come of age.

The Dulmont Magnum has the power, ease of programming and flexibility to compete with units many times its size, yet it offers the one thing they can't.

Real portability.

Find out more about the Dulmont Magnum. Clip the coupon below for our free colour brochure.

It outlines the advantages of this unit, and supplies all the technical information you'll need.

For further information and full specification return the coupon to:
The Marketing Manager, President Office Machine Group,
100 George Street, Hornsby, N.S.W. 2077. Telephone: (02) 476 2700

☐ Please send me your colour brochure on The Dulmont Magnum.

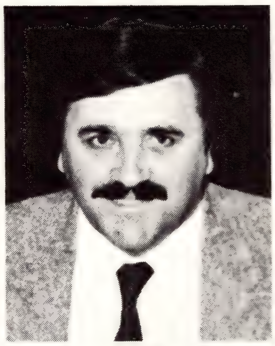
NAME ____________________

ADDRESS ____________________

____

____________________ TEL __________

president
OFFICE MACHINE GROUP



TOM COOPER – M.D.

13 years ago, the President Office Machine Group began, distributing typewriters and calculators. In 1977 we commenced building calculators from S.K.D. kits and followed shortly with a typewriter factory of our very own. It was in 1980 that we made the move to computers, buying design rights to the Australian system Concept II, and committing ourselves to the formidable task of finding the optimum in equipment from a world-wide selection.

Now, in 1983, President can offer not only top quality computerware, we can offer it throughout Australia with 160 dealer outlets, 400 vehicles and 900 personnel. That's experience totalling around 2,700 years. They'll come to you, to your office, with the President promise of servicing whatever we sell.

president
COMPUTERS

P.O. Box 203,
Hornsby. N.S.W. 2077
Telephone: (02) 476 2700

Name: . . . .
Address: . . . .
. . . . Telephone: . . . .
Type of Business: . . . .
My nearest President outlet is . . . .

Please send me more information on the:

- ☐ Kaypro II
- ☐ Kaypro 10
- ☐ Columbia Twin Floppy
- ☐ Columbia 5 Meg
- ☐ Columbia 10 Meg
- ☐ Columbia V.P.
- ☐ Columbia Multi User
- ☐ Printer Letter Quality
- ☐ Printer Dot Matrix
- ☐ Magnum
- ☐ Franklin 1200
- ☐ Franklin 1000
- ☐ Software
- ☐ Other

Major President Outlets

NEW SOUTH WALES

Computermax
539 Pittwater Road
BROOKVALE 2100
Ph. (02) 93 1383 A.H. 908 1718
Open 8.30-5 Mon.-Fri 8.30-12
Sat. Contact Max Leonard

Desktop Computers
10 Cowper Street
GRANVILLE 2142
Ph. (02) 637 3062
Open 9-5 Mon.-Fri. 10-4 Sat, Sun.
Contact Charlie Dorn

President Computers
Rear 100 George Street
HORNSBY 2077
Ph. (02) 476 2700
Open 9-5 Mon.-Fri. 10-4 Sat, Sun.
Contact Hugh Burns

Computer Galerie
66 Walker Street
NORTH SYDNEY 2065
Ph. (02) 929 5497 Open 9-6
Mon.-Fri. 9-8 Thurs., 9-2 Sat.
Contact David Diprose

Delta Computers
12 Fetherstone Street
BANKSTOWN 2200
Ph. (02) 705 6636 A.H. 639 0248
Contact Wanda Bates Open 9-5
Mon.-Fri. Contact Garry Wylie

Dataspeed
3rd Flr, 355 Sussex St.
SYDNEY 2000
Ph. (02) 267 9999
Open 9-5 Mon.-Fri., 9-2 Sat.
Contact P. Marjot

VICTORIA

Minit Computers
119 McCrae Street
BENDIGO 3550
Ph. (054) 43 2589
Open 9-5 Mon.-Fri. 9-12 Sat.
Contact Len Williams

Robs Computer Center
275 Thomas Street
DANDENONG 3175
Ph. (03) 791 2900
Open 9-5.30 Mon.-Fri. 9-12 Sat.
Contact Rob Kloester

Halifax Business Systems
160 Johnston Street
FITZROY 3065
Ph. (03) 419 8144 Open 9-5
Mon.-Fri. Contact John Hopkins

Greensborough Computers
81 Grimshaw Street
GREENSBOROUGH 3088
Ph. (03) 434 6166
Open 9.30-5 Mon.-Fri. 9.30-4 Sat.
Contact Kevin Heraud

President Computers
Suite 1, 609 St Kilda Rd
MELBOURNE 3004
Ph. (03) 529 1788
Open 8.30-5 Mon.-Fri. 9-12 Sat.
Contact Steve Freeman

The Computer Fair
180 Flinders Street
MELBOURNE 3000
Ph (03) 63 4324
Open 9-5 Mon.-Fri. 9-12 Sat.
Contact Bill McPherson

QUEENSLAND

Cygnus Computer Services
Suite 4, 104 Fitzroy St.
ROCKHAMPTON 4700
Ph. (079) 27 8872 A.H. 27 1794
Open 9-5.15 Mon.-Fri.
Contact David Halsey

President Computers
416 Logan Road
STONES CORNER 4120
Ph. (07) 397 0888
Open 9-5 Mon.-Fri. 9-12 Sat.
Contact Bill Brown

Software-80
Shop 8/200 Hoggill Rd
TARINGA 4068
Ph. (07) 371 6996
Open 9.30-5 Mon.-Fri. 9-7 Thurs.,
9-12 Sat. Contact Alex Morrison,
Tony Melius

SOUTH AUSTRALIA

Peterson Business Machines
100 Pirie Street
ADELAIDE 5000
Ph. (08) 223 6333
Open 9-5 Mon.-Fri. 9-11.30 Sat.
Contact Reg Goodhew

Microhouse
384A Unley Road
UNLEY PARK 5061
Ph. (08) 272 4370 Open 10-6
Mon.-Fri. Sat. by appointment
Contact Geoff Maloney

WESTERN AUSTRALIA

Micro EDP & Hardware
9a/1 Leura Avenue
CLAREMONT 6010
Ph. (09) 384 5511
Open 9-5.30 Mon.-Fri. 9-12.30
Sat. Contact Gary Triffitt

president GROUP
SETTING THE STANDARD

Enter K051 on Enquiry Card

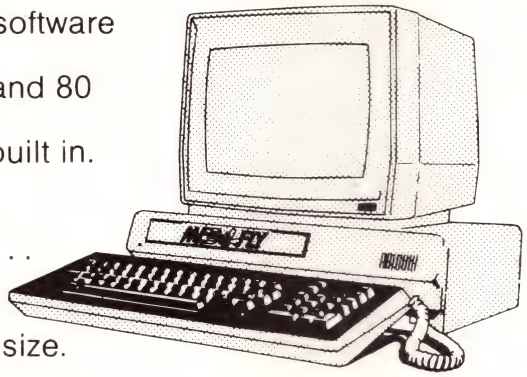
Micro-Educational

17 PARK ROAD,
GARDEN SUBURB, NSW 2288

Phone: (049) 43 6805
(049) 43 0624

SPRING CATALOG NOW AVAILABLE

BASIS MEDFLY



FEATURES:

Runs nearly all Apple software as well as CPM ! ! !
Switches between 40 and 80 column as needed ! ! !
PAL colour and RGB built in.
High quality separate keyboard . . . fabulous styling . . . Built in fan . . .
Serial & parallel ports built in.
64K standard memory size.
Extra 64K acts like a disk drive — fantastic improvements in processing speed possible!
5¼" floppy, or 8" floppy available.

CP/M SUPPLIED. RUNS ALL APPLE® PERIPHERALS INC. DAVONG HARD DISK.

128K VERSION	**$1695** ex Tax
	$1845 inc Tax

STOP PRESS Sandy's Word Processor is now available in MedFly version
$175 ex tax **$195** inc tax

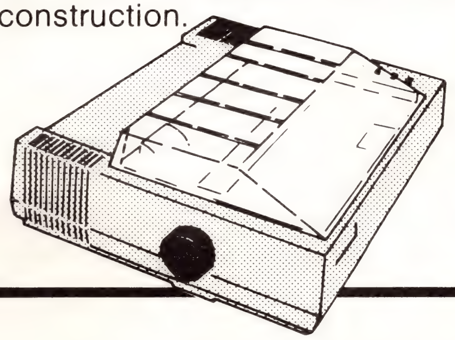
AMUST DT-80 PRINTER

A Runaway success, selling 500 units per month!

NOW REDUCED BY **$100!**

FEATURES:

Superb print quality . . . 80 CPS bidirectional . . . bit image graphics . . . full descenders . . . italics . . . double density and double pass . . . normal, compressed and double width . . . friction AND tractor . . . multi-strike carbon ribbon cartridge . . . low-cost removable print head . . . quality construction.



PRICE:

Parallel:	**495** ex tax
	560 inc tax
Serial:	**595** ex tax
	670 inc tax

Cables available to suit most computers

SPECIAL OFFER

CONTROL DATA
5¼" FLOPPY DISKS

- Plastic Library Box
- Double Density!
- Reinforcing Hubs
- Top Quality
- Soft Sectored
- Suit Apple, TRS-80, etc

PRICE $35 INC TAX ! !
(Normally $40)
(Add $2 Post)
ONLY WHILE STOCKS LAST
AND ONLY TO APC READERS
OFFER EXPIRES SEPT 30

SUPER SPECIAL:
100 DISKS for **$310!**
RING NOW! THEY WONT LAST

APPLE COMPATIBLE DISK DRIVES

ATLAS SLIMLINE
HIPPO SQUARELINE

BOTH $395 ex tax
445 inc tax

APPLE CENTRONICS PARALLEL PRINTER CARD from AUTOMATIC ICE

FEATURES:

- Fully firmware compatible
- Graphics dumps to most dot-matrix printers including AMUST DT-80
- Printer spooling in Applesoft!
- Includes cable and connector

Throw away your old incompatible printer card for the fully com-patible Automatic Ice card

PRICE: **$99** ex tax
$110 inc tax

Dear George,
Please rush me
☐ MEDFLY information
☐ Free Spring Catalogue
☐ 1983 Software Buyers Guide ($3.95)
Add $3 Post/$6 Courier Delivery

Name ....
Address ....
.... Postcode ....
Bankcard No ....
Expiry Date ....
Signed ....

Enter K013 on Enquiry Card

Package to boost keyboard literacy

Speed of keyboard operation is essential for computer users. Noel McIntosh discusses the development of his touch-typing software program.

"THE finger plods its weary way and leaves the computer to darkness and to me." I wish I could type that without looking at the keyboard to guide two fingers from key to key and then looking back to the text.

What is wrong with looking at the keyboard while typing?

You cannot type at more than 15 to 20 words a minute with 97 per cent accuracy if you visually locate each key struck.

This is very slow — slower than you can write and about half the speed you could touch type. You learnt cursive writing when you were eight, so why not learn to type correctly. It's an important skill for everyone who wishes to communicate effectively with computers.

In the office of the future, keyboard literacy will be a required skill in all levels of management. Already, it is a criterion in the selection of many middle-management positions. Many professionals use computer keyboards more than pen and paper.

Obviously, we haven't learnt to type quickly because it was inconvenient and time-consuming to attend a typing college and soul destroying to learn from a book. Now, there is no excuse, as you can learn in about 15 hours in your office or home on your fascinating computer for about $75.

What about the next human generation? Are we going to ensure that they learn to touch type so they can use text processors for student assignments or effectively use the school computers?

When I bought a micro I wanted to learn to type. Calls to dealers revealed typing instructors for Apples, TRS-80 and home computers, but none for CP/M computers, of which there are between 500,000 and 1 million in the world.

A thorough search in Australia, the UK and USA didn't reveal anything, although there may have been little-known courses. All the gurus said there were plenty around and anyone could write one — well yes, like poetry, anyone can write a poem, but very few are good. This looked like an opportunity to fill the market with a top-quality package.

Developing product

The project started with a detailed analysis of the non-CP/M computer tutors. It appeared to us many tutors were poorly conceived, based on doubtful teaching techniques, hobbled by inefficient programming languages and poor memory utilisation.

Ideas were formulated and theoretically tested until I was satisfied a good instructor could be built, based on professional teaching techniques. Market research proved the need for a proper course and not a game.

Next step was to find a software house capable of handling the problems associated with various CP/M computers and able to write in a language which could handle the complicated nitty-gritty. We wanted to use less than 50K of memory and 90K of disk; we needed sophisticated string handlers and to get close to machine code and have fast run-time instructions. The compiler language, C, was chosen — it is also transportable to many computers.

The development phase took five times the estimated duration, partly because the concurrent field tests highlighted areas where improvements in teaching technique could be made. These tests employed many people ranging from seven to 70-year-olds, one to 10 fingered.

When the teaching system was complete the operational environment was built and tested until foolproof. The Students' Guide was written and field tested.

Selling product

So much for the technical development — we now had the better mousetrap but no pathway. An analysis of the market possibilities revealed too many questions with few answers.

Advice was sought from consumer marketing experts, dealers, direct marketeers and advertising gurus. More unanswered questions came but now on a higher plane. All this advice was distilled until a marketing plan appeared and decisions were made on an image , how we would approach the

When selecting a computer keyboard trainer look for the following important criteria:

- It must hold the student's interest, give encouragement, reinforcement and generally motivate the student.
- The exercises must be interesting with different screen formats, a minimum of nonsense drills and a maximum of plain English text.
- Typed errors must be identified immediately and be corrected before the cursor moves on.
- The course should be divided into seven to 15 discreet lessons, each starting with a stated objective and progress reports should be interesting — list weak keys and divide the known keys into a few speed categories —slow or fast.
- Artificial intelligence should be used to introduce weak keys at a higher frequency to give the student extra practice.
- The sequence of learning new keys must be predetermined to avoid learning bad habits.
- Once the location of the keys is learnt, the student's speed should be increased through the use of a forced pacing system.
- Provide guidelines on how to strike the keys, correct body/hand/finger positions, lesson description, and so on.

market, dealers, distributors and OEM's.

We chose to launch at the Australian Personal Computer Show in March. Four computer distributors agreed to mount demonstrations, mainly because of the vacuum our product filled, its quality, the fact that it was developed in Australia and, a degree of sympathy for battlers.

We used this opportunity to do more market research and watched as children and adults were captivated by the exercises. You have to have a rugged program to withstand a show.

We gave out hundreds of dollars worth of our high-gloss brochures and took orders worth about the same.

We knew we had simultaneously to work on the home and overseas fronts, or we would be overtaken by competitors. TYPEQUICK is not a fad product, like a game, but a long-life product.

But good software will not remain on the market unchallenged for long. We wanted to test our marketing concepts in Australia and use the cash flow from the local operations to fund the overseas thrust.

To speed up acceptance we needed the endorsement of respected experts. The deputy managing director of Pitman, who had recently completed a worldwide study of the microcomputer-based typing instructors, was invited to study the course and if satisfied to add Pitman's endorsement. We also received favourable comments from the teaching profession in the colleges.

We called on Australian dealers, but sold only to the adventurous ones. The rest wanted to see retail demand, which our advertising campaign has since created.

Dealers look for 30 to 40 per cent margin, while distributors ask for about 70 per cent with the authors paying all production costs. The residue is small.

We decided to distribute ourselves until we reached a stable demand. We are approaching sales of 500 so we are happy with our marketing efforts.

Export orders are exciting, but foreign repeat orders even more so. We have yet to crack the really big ones in the US and UK, which can only be done by personally visiting distributors.

While all this marketing was happening, new information came to hand and we saw improvements which we have made. We have had to copy it on to tens of disk formats and write a subsystem to handle the many different screens. Of course, we have had to convert it to MS DOS, PC DOS and CP/M-86 which involved converting to a 16-bit C compiler. Next, we will alter it to handle the Dvorak keyboard.

• *Noel McIntosh is the managing director of Aid Systems Pty Ltd of Sydney.*

DO YOU OWN A COMMODORE 64?

We have possibly the LARGEST range of software packages for the Commodore 64

– with more programs to come!

Quality programs at affordable prices. From business applications to adventure games, action space games, word processing and educational programs.

CHOOSE FROM THIS EXTENSIVE RANGE

Word Processing, Mailing and D-Base	
Victext – Cartridge (Vic-20)	$149.00
Busiwriter	$85.00
Vizawrite	$125.00
The Filing Assistant	$120.00
Personal Finance Assistant	$99.00
The Writer Assistant	$120.00
Programming Aids /Tutorial	
Data Handler 64	$95.00
Touch Typing Tutor (Tape)	$29.00
Spreadsheet Analysis	
Busicalc I 64 (Vic-20)	$85.00
Business Applications	
Debtors	$99.00
Creditors	$99.00
General Ledger	$99.00
Stock Control	$99.00
Games and Recreation	
Cosmic Capers	$18.00
Cosmic Cruzer (Vic-20)	$18.00
Goblin Towers	$18.00
Guitar Tutor I (Vic-20)	$21.95
Guitar Tutor II (Vic-20)	$21.95
Hunter Killer	$21.95
Kaktus	$18.00
Lord of Balrog	$18.00
Mangrove	$18.00
Medicine Man	$18.00
Music 64	$15.00
Stix	$18.00
Tank Atak	$18.00
Weather War II	$18.00
Worms	$18.00

plus many more

SOUTHPAC

Contact your local South Pacific Software dealer or state distributor

N.S.W S.A. The Microcomputer House Pty Ltd
116 Abercrombie St
Chippendale 2008
(02) 698 7866

QLD. C.W. Electronics
416 Logan Rd
Stones Corner 4120
(07) 397 0808

VIC. Gippsland Computer Bus. Services
167 Pacific Highway
Bairnsdale 3875
(051) 525 939

W.A. Vicwest
PO Box 182
Tuart Hill 6060
(09) 444 3039

TAS. Desktop Solutions
13/22 Murray St
Hobart 7000
(002) 346 752

Enter K031 on Enquiry Card

How to buy a computer by the numbers.

Introducing the Cromemco C-10 Personal Computer. Only $2648*, including software, and you get more professional features and performance for the price than with any other personal computer on the market. We've got the numbers to prove it.

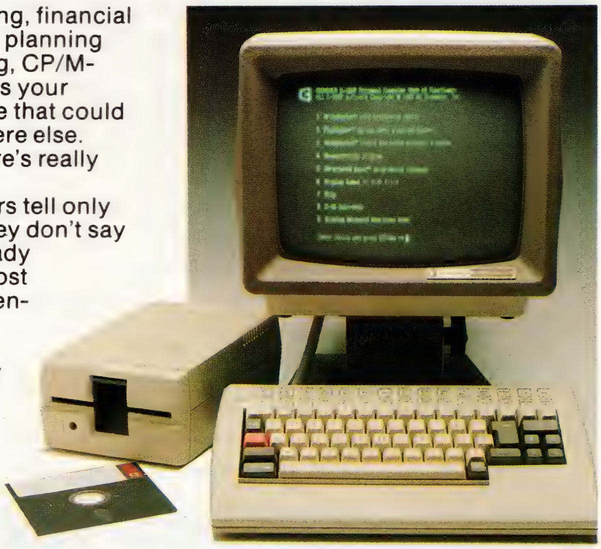
The C-10 starts with a high-resolution 12" CRT that displays 25 lines with a full 80 characters on each line. Inside is a high-speed Z-80A microprocessor and 64K bytes of on-board memory.

Then there's a detached, easy-to-use keyboard and a 5¼" disk drive with an exceptionally large 390K capacity. That's the C-10, and you won't find another ready-to-use personal computer that offers you more.

But hardware can't work alone. That's why every C-10 includes software - word processing, financial spread sheet, investment planning and BASIC. Hard working, CP/M-based software that meets your everyday needs. Software that could cost over $1500 somewhere else. FREE with the C-10. There's really nothing else to buy.

But the C-10's numbers tell only part of the story. What they don't say is that Cromemco is already known for some of the most reliable business and scientific computers in the industry. And now for the first time, this technology (including networking and communication) is available in a personal computer.

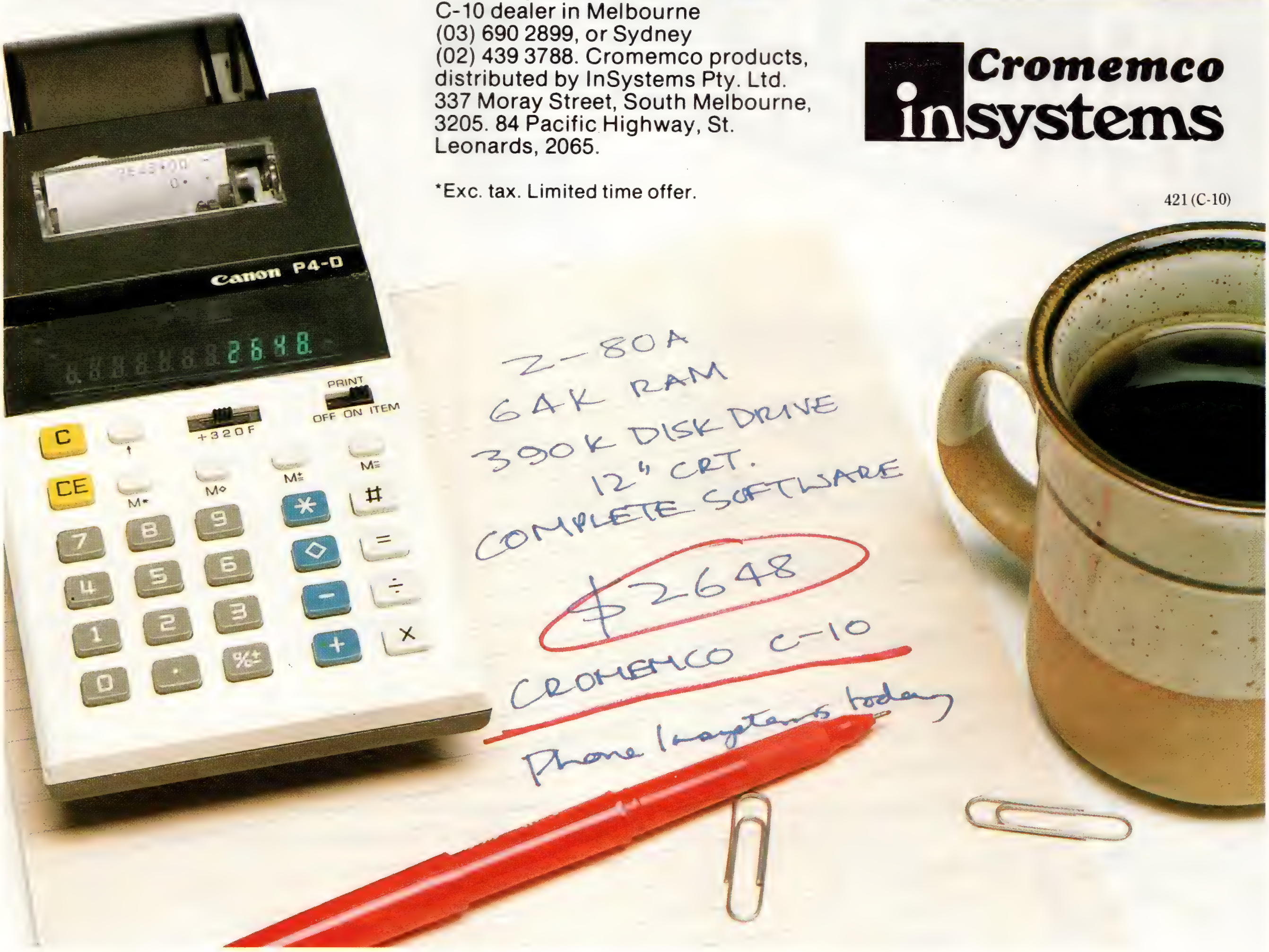
One last number. Call InSystems for the name of your nearest C-10 dealer in Melbourne (03) 690 2899, or Sydney (02) 439 3788. Cromemco products, distributed by InSystems Pty. Ltd. 337 Moray Street, South Melbourne, 3205. 84 Pacific Highway, St. Leonards, 2065.



Cromemco
insystems

*Exc. tax. Limited time offer.

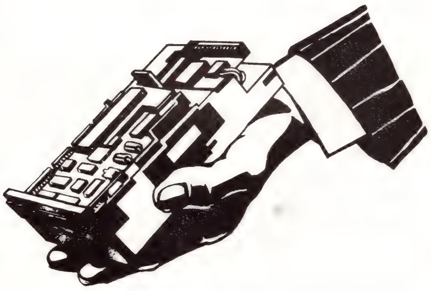
421 (C-10)



For your requests: just some of the disks in our library.

Storage capacity. Weight. Physical size. Access time. The needs of the computer manufacturing, instrument, and OEM industries place enormous and highly varied demands on the suppliers of disk drives. **Ampec** may not have all the answers in this field, but we do have most of them. And we do have the best of them — representing the world's leading makers, and offering drives to meet a staggering range of applications.

3¼″ Drivette. The Tabor Corporation have taken the proven technology of floppy disks and scaled it down to offer 500Kbytes in their TC-500. Compatible with the standard 5¼″ drive, but it's one-fourth the size, half the weight, and requires 40% less power.



8″ 'Magnum'. A high-speed special from Micropolis; the new 8″ rigid disk drive called MicroDisk. This drive gives you more capacity than a 14″, incorporating up to three platters — at lower cost and with less space requirements.

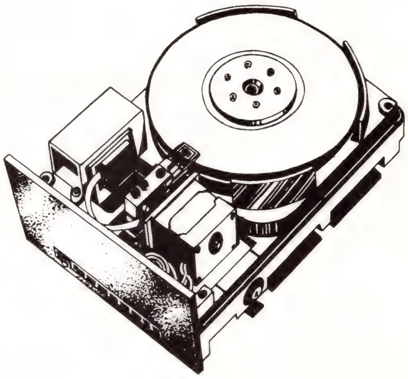
High-capacity 5¼″. The MiniScribe M4 combines traditional disk and high-performance Winchester technologies to offer OEM's a drive that is simple, reliable and economical. 10 and 20 Mbytes on one and two disks respectively; increased number of recording tracks — 960/1920 TPI; 120 milliseconds average access time; ST412 interface compatibility.

1 / 1.6 Mbyte Floppies. Micropolis can meet your needs for high capacity in 5¼″ floppies. Single-sided with 0.5 million bytes — and double-sided 1 megabyte capacity. For current 96/100 TPI floppy needs, there's the field-proven 1115/1116 series. For future systems, consider the new 1.6 megabyte Model 1117.

Slimline Floppy. From Canon, a Mini Floppy drive that's only 33.5 mm high. It offers 1 Mbyte of storage, 96 TPI, double-side and density and minimum maintenance.

3.9″ Cartridge. The first low-cost 3.9″ Winchester disk drive with removable cartridge media. SyQuest give you 6.38 Mbytes of removable data storage, and plated media for protection; plus the same DC power needs as a standard mini floppy and the use of existing 5¼″ Winchester controllers — without modification.

5¼″ Classic. The masters of micro-Winchester, Seagate, offer the value series — the ST400 family. Capacities from 6.38 to 19.14 Mbytes; proven design; onboard microcomputer. All with compatible interface, same size and mounting, and same DC voltage as for the industry-standard ST506.



And many more. "If you can't see what you want in the window, please ask inside." Ampec have lots more to show you in both hard and floppy formats, so please contact us with your requests.

AMPEC
The absolute in peripheral thinking.

(02) 818 1166 (03) 878 8788
(07) 57 9366 (08) 212 6068 (09) 272 7511

Am 009

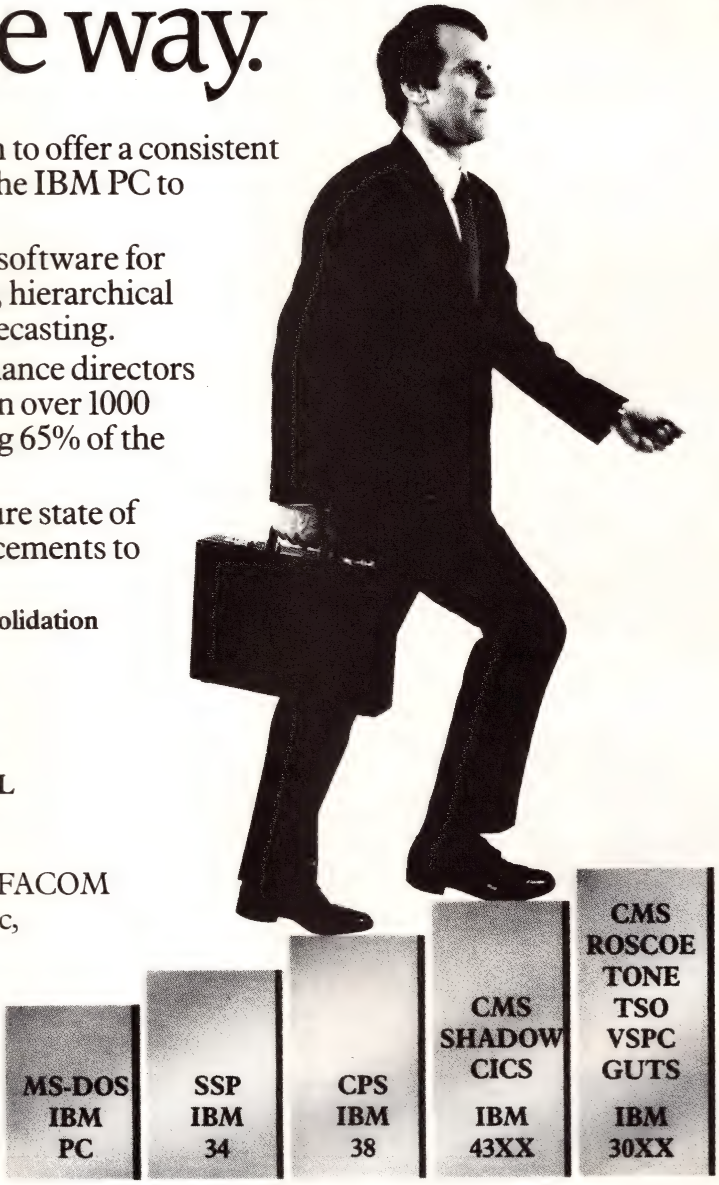
Micro·Mini·Mainframe FCS-EPS is with you every step of the way.

The first Decision Support System to offer a consistent syntax all the way through, from the IBM PC to the 30XX mainframe series.

- ★ Integrated Fourth Generation software for applications such as budgeting; hierarchical consolidation and cash flow forecasting.
- ★ Used by corporate planners, finance directors and management accountants in over 1000 companies worldwide including 65% of the UK top 100.
- ★ Continuously upgraded to ensure state of the art software. Recent enhancements to mainframe versions include:
  - ★ **MULTIDIMENSIONAL consolidation**
  - ★ **COLOUR graphics**
  - ★ **SCREEN management**
  - ★ **EXTERNAL FILE linkages**
  - ★ **ADVANCED programming/ Text handling**
  - ★ **INTEGRATED RELATIONAL database**

Widely available on other manufacturers' machines, including DEC, FACOM Hewlett-Packard, ICL, Prime, Univac, Honeywell and Wang.

Micro-FCS is the totally compatible micro version of FCS-EPS and is available on the IBM PC, Sirius, Apple and other leading 8 and 16-bit micro computers, including UNIX-based systems such as Onyx, Wicat and Plexus.


MS-DOS IBM PC
SSP IBM 34
CPS IBM 38
CMS SHADOW CICS IBM 43XX
CMS ROSCOE TONE TSO VSPC GUTS IBM 30XX

IBM System 38 version to be released shortly

☐ I would like the opportunity to attend an executive presentation of Micro FCS-EPS on November 15th in Sydney.

☐ Please send me more information on FCS-EPS.

☐ Please arrange for a consultant to contact me.

NAME________________________

ADDRESS________________________

COMPANY________________________

POSITION____________ TEL.____________

Offices in: MELBOURNE (03) 699 7801 PERTH (09) 364 9099

FCS-EPS

The Business and Planning Specialists.

EPS SOFTWARE CONSULTANTS PTY LTD
84-86 Pacific Highway, St. Leonards, NSW, Australia, 2065.
Telephone: (02) 439 3722

SOME OF AUSTRALIA'S BIGGEST COMPANIES WOULDN'T BUY ONE OF THESE...

commodore
COMPUTER

sirius
COMPUTER

IBM

...WITHOUT ONE OF THESE

Sold and Serviced by
MicroComp
Ph: 614 1433. 561 BOURKE ST., MELBOURNE 3000.

In microcomputers, as in any machine, a system is only as good as its backup. Which is our strong suit at Microcomp. For a start, we won't just sell (or rent) you a computer. We'll advise you on the right combination of machines and accessories, and develop custom-designed programs to answer your particular needs, now and in the future.

Then, we're ready with all the backup you need, including on-the-job training, servicing, replacement machines and much more.

All this, plus four years experience in microcomputers, is why the big names above chose us to sell their products. And it's why a lot of other big (and small) names come to us to buy them.

We've set out in black and white what we believe should be your *minimum* requirements, in our Corporate Account Support Policy, which we'll be happy to send you on request. It makes very encouraging reading.

MicroComp

B. S. MICROCOMP PTY. LTD.,
561 BOURKE STREET, MELBOURNE 3000.
CALL BILL SAUNDERS ON 614 1433.

JLM/MC10

High technology for a country practice

A Gippsland medical practice has computerised its accounts and patient details. Jenni Gyffyn outlines the conversion to Medibill and the problems involved.

SOMETHING about the medical profession tends to daunt most computer companies — perhaps it is the awe generated by those who heal, or maybe it is the complexity of services offered by the attending paperwork. Whatever the reason, Australian doctors and specialists have been slow to computerise.

Eight months ago, a medical practice in Gippsland was approached by Jenni Gyffyn, marketing manager with Gippsland Computer Business Services (GCBS), a Commodore computer dealership. Many of the programs offered were written by John Gyffyn, the manager and systems analyst of the business.

The senior partner went over the card system his practice used and decided it would be nice to have a computer which would store patient names, addresses and account details. The junior partner had more far-reaching ideas.

He wanted a computer program which could produce diagnostic reports at the mythical touch of a button, showing him such things as the number of patients who had been into the surgery over the past six months with influenza. He also wanted something that produced reminders at regular intervals, such as smear tests for female patients.

The receptionist, the practice's accounts department and front-line person, had been with the practice since it started in 1969. She knew the ropes, and had such a calm reassuring air about her that it seemed nothing could rattle her.

But paperwork was a permanent problem. Being a country surgery, the doctors serviced a large farming community as well as tourists and the local hospital.

There were 3200 families on record, and accounts that dated back a long time, some still unpaid. The receptionist had to hand-type statements each month, and this could take her a week.

While doing this she carried out day-to-day duties such as handling reception, phoning the hospital for X-ray and pathology results, noting patient name or address changes as well as new patients, and keeping the daily visits flowing smoothly.

The practice's accounts were not up to date, and she was interested in something that could control this area for her. At the same time she had never had anything to do with computers, and had no idea of how they worked or what her involvement could possibly be with one.

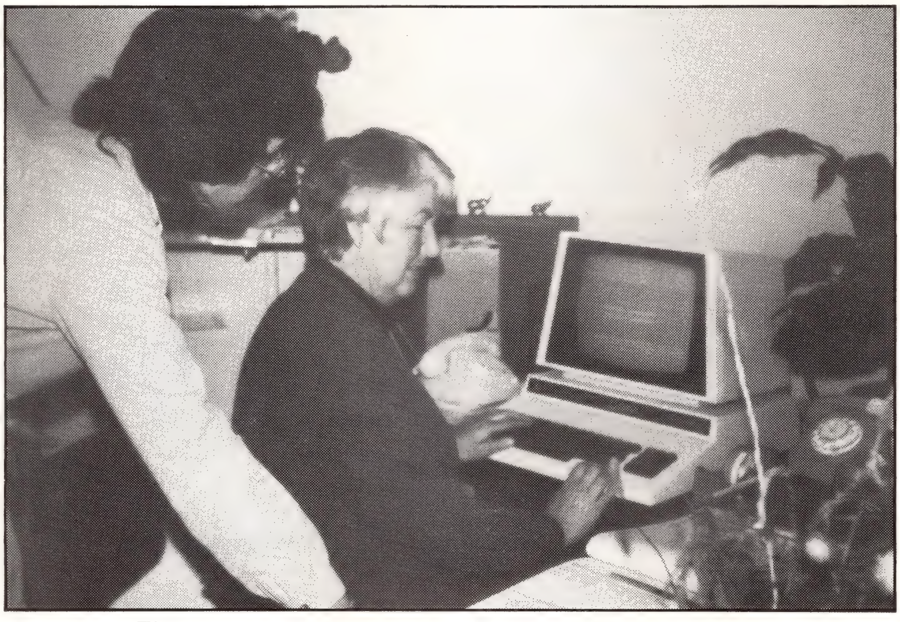
The doctors had read plenty of literature about computers, and friends in Melbourne had one, but apart from some advanced ideas as to what they would like to do if they had one, none of them had gone any further.

Four months passed, while behind the scenes two events were taking place. GCBS had been in consultation with 10 doctors, specialists and the Royal Australian College of General Practitioners, gleaning information as to what medical practices would want incorporated into a computer program. Everyone had something different to contribute to what became John Gyffyn's MEDIBILL program.

Meanwhile, a friend of the receptionist's who ran a large fuel depot in the town bought a Commodore computer to handle the business' debtors. She showed her what it did and how easy it was to operate, and her enthusiasm was so infectious that the next time computers were discussed at the surgery, the receptionist said she wanted one. The doctors visited the fuel depot where they, too, were met with the same glowing reports and demonstration of the system.

In March this year a Commodore computer with 7.5M-byte hard disk running MEDIBILL was installed in the practice. Installing a computer into a medical practice is not an overnight affair.

All those patient's names, addresses and account details have to be typed into the system, and no medical office staff have the time to do this while trying to maintain their own duties. Knowing this, GCBS sent a representative into the surgery to type in all the information, which was done in a back room while



The practice's receptionist was the key to success.

the practice remained undisturbed. Apart from the faint rasping of a printer keeping a paper copy of each patient detail being typed, no one was aware of the computer.

Schedule items and their descriptions were typed in. Letterheaded statement paper had to be produced by Kalamazoo in large quantities.

Extensions to the receptionist's desk had to be made to house the hardware. The hard disk drive was placed on a doormat in the corner where it would sit quietly whining to itself, a potted plant shielded the computer from patients to soften the impact, the floppy disk drive was placed on a shelf out of the way and the printer lurked at knee level behind the receptionist's chair.

The best paid plans of mice and men . . . the installation was smooth except for two disasters. The first occurred when several days of data entry were obliterated from the hard disk, and had to be retyped rather quickly. The second, and much worse, took place after GCBS had completed the installation. At the end of March the receptionist put the computer through its end-of-the-month procedures, when suddenly while balancing forward the hard disk drive stopped and flashed its red error light.

GCBS made the one-hour drive down to the practice immediately, checked out the system and found it was working perfectly. Failure was attributed to a power fluctuation of large magnitude, enough to get past the line filter that was linked into the system.

But at the end of April the same thing occured and everything came to a full stop. GCBS took the hard disk away, and after many heart-stopping moments, diagnosed the problem.

The fault lay not with the program, but within the hard disk, which was behaving like a record-player stuck on a cracked record, going round and round on the same spot. John Gyffyn diagnosed the problem and the fault was permanently rectified.

MEDIBILL has been with the practice for five months now, and the receptionist has found that owning a computer brings a number of benefits.

"When you get someone who has had an outstanding debt for a long time, it's very tempting if you're typing out their statement manually to say 'They're never going to pay this' so you don't type it. You think, 'Well, it's going to cost me so much to type it and so much for postage'. When people now get their account from the computer they seem to pay more regularly. We've had people pay who've had very old debts outstanding.

> *'Balancing the books at the end of each day used to be a headache for the receptionist, but now MEDIBILL automatically prints out a bank reconciliation for her, with full invoice, cash, cheque and bankcard voucher breakdown.'*

Government authorities such as the Workers Compensation and the Motor Accidents Board take a long time to pay claims. Now, with a regular statement being sent to such bodies every month, it is hoped they will pay more promptly.

The doctors have plans for their computer. They use it for their personal finance records and for producing diagnostic analyses of patient problems and visits. This function is is already programmed into MEDIBILL, and the system will report on any area of patient information and treatments done.

MEDIBILL has also created a greater sense of accuracy. If a wrong entry is made (for example, an invoice instead of a receipt or an incorrectly entered amount) there is all the trouble of issuing credit notes or a special dummy invoice. The information can be corrected if wrongly entered, but as the receptionist says, "If you make a wrong entry it gets printed out on paper for all the world to see, so it teaches you to be very accurate the first-time round."

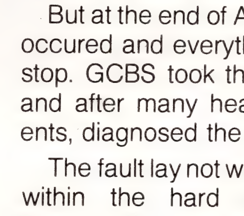
Balancing the books at the end of each day used to be a headache for the receptionist, but now MEDIBILL automatically prints out a bank reconciliation for her, with a full invoice, cash, cheque and bankcard voucher breakdown. To assist the doctors, a summary of the day's activities is also produced with a list of every patient seen and what was done by which doctor.

Similarly, at the end of the month, everything is carried out by the computer. The receptionist leaves the computer running overnight to print statements and do the balancing forward of accounts, and when the practice is opened the following day, everything has been completed.

Some practices encourage their patients to pay at the time of the visit, in which case, MEDIBILL would be set up to produce the bill and receipt on the spot. The practice sends out accounts on a monthly basis, which is where MEDIBILL "remembers" every visit during the month and prints them out in statement form.

With Medicare looming next year, MEDIBILL is way ahead of the proposed scheme. By adding a second printer, bulk billing is available printed directly on to assignment forms supplied by the Department of Health.

The doctors are pressing the receptionist to branch out into other applications with their computer, but she is concerned with mastering what they have before exploring further features of MEDIBILL. ☐



MAX FOR MICROS

How can I afford to give my clients the necessary time to ensure they and their systems work efficiently? Easy. . .
SERVICE IS MY BEST ADVERTISEMENT

COMPUTERMAX

PH (02) 93 1383
AH 908 1718
539 PITTWATER RD, BROOKVALE 2100

Enter K056 on Enquiry Card

THERE ARE SOME THINGS YOUR DOT CAN'T DO.

YET.

Momma said there'd be days like this. But who listened to Momma. And, of course, she didn't own a DOT. If she did, she'd know you can depend on DOT. For spreadsheets, word processing, program generation, complex calculations, program development, financial analysis, games . . . But toast? Well, although it seems like DOT can do anything, you can forget about DOT toast, for the moment.

But when it comes to personal computing tasks in the office, on the road, at home, you'll be amazed at DOT's versatility.

And talk about power and performance. In a totally integrated package, you get a powerful micro-processor, and up to 704K bytes of main memory. Why, that's more memory than you've got this morning! Floppy diskette storage of up to 574K bytes, communications capabilities, and a quiet reliable thermal printer. Nothing was left out.

The best thing is that with all these capabilities, you don't need a desk the size of Australia to hold it. And you don't have to be a combination of weightlifter and juggler to move it somewhere else. You can just put on the case, pick it up and go.

The bottom line is that Computer Devices has the experience and power to back up the DOT. That's right, the same company who's been providing reliable terminal/printers for people like you to access someone else's computer resources, now puts that experience to work in a personal computer. So wake up — If you want to make it through the day, you need a DOT.

DOT™

BUT MAN DOESN'T LIVE BY BREAD ALONE.

Introducing DOT, the personal computer that's about to simplify your business world.

Just imagine, a totally integrated, powerful computer that's so portable you can put it on your desk, or take it wherever you go. We believe that it's the best value for money computer you can buy.

DOT will give you tremendous control.

You'll be able to examine your problems, analyse them, and solve them with the speed of a 16-bit processor.

And, with DOT's in-built printer, you can get your results wherever you are.

There's an impressive range of software and easy-to-follow documentation that covers just about any need.

DOT software supplied and supported by Computer Devices includes:

* Microsoft's MS-DOS operating system, Multi plan spread sheet, and GW-Basic, which includes graphics functions and the compatible MS-Basic Compiler.

* Microsoft's Fortran, Pascal, Cobol, and Macro Assembler.

* The newly fashionable Volkswriter word processor.

* Datamension Corp's Suite — Record Manager, Report Manager, Project Manager and Time Manager.

* Relational Data Base, Personal Pearl, and Application Generator Pearl Level 3.

Fully integrated accounting packages for Australian business.

* Optional Z80A CPU to implement CP/M 2.2.

* Provision for optional Intel 8087 Numeric Data Processor.

* Asynchronous and (IBM327X/3780) by-synchronous Terminal Emulation.

* Programmes for DOT, and the IBM PC plus a connecting cable to download PC software to DOT, a service which Radaro Computer Devices offers to provide for customers.

Frankly, we believe we have thought of everything. Power. Portability. Plus Printer and value for money.

DOT™

So if you're one of the people fortunate enough to have waited, get the word on DOT. Call our number (03) 67 6638 or return the coupon for information, and learn the whole story on DOT, the powerful professional workstation that really means business.

DOT is a trademark of Computer Devices, Inc.

* Dot specifications: MS/DOS° operating systems; 16 bit 8088 processor; optional Z80 CPU to implement CP/M2.2; 256K memory on single board, expandable to 704K; dual 3½" Floppy disks with 287K each; built in 160 CPS printer, with 80 or 132 characters/line and graphics capability; easy to read 5" x 9" monitor with bit-map graphics with high resolution 1056 x 248 DOTS and complete range of character display capabilities; asynchronous and IBM communications.

°MS/DOS is a trademark of Microsoft Corporation.

Offices located in Burlington, MA; Atlanta, GA; Chicago, IL; St Louis, MO; Houston, Dallas, TX; New York, NY; Philadelphia, PA; Washington, DC; Los Angeles, San Francisco, CA; and Paris, France.

RADARO
COMPUTER DEVICES

316 QUEEN STREET, MELBOURNE 3000.
(03) 67 6638.

Name ....

Title ....

Company ....

Street ....

City ....

State .... Postcode ....

Telephone No. ....

Australian Micro-Computer

RADARO COMPUTER DEVICES
EXCLUSIVE AUSTRALIAN DISTRIBUTORS
FOR DOT.
316 QUEEN STREET, MELBOURNE 3000.

DEALER ENQUIRIES INVITED.

Enter K054 on Enquiry Card

How the mighty chips will shape our future

SPURRED on by developments in integrated circuit technology, a new generation of personal computers is taking shape, and the IBM PC and its clones are at the forefront. James Fawcette, executive vice-president of EW Communications, a technical magazine publishing company in Palo Alto, California, examines the changes.

AS PC users, it's sometimes hard to remember that the inanimate metal boxes in front of us are susceptible to evolution. But occasionally a product is introduced that forces the complete redesign of our personal computers.

Integrated circuits (ICs), the devices that bring intelligence to our machines, have reached a new level of technological achievement, and now the computers that use them must advance as well. Strange as it seems, these small silicon chips are setting the guidelines for the next generation of personal computers.

Now the personal computers have caught on, the semi-conductor manufacturers who make ICs are eyeing the swelling market for personal computer ICs.

Dozens of newly developed semiconductor chips are being aimed at the personal computer market. These chips range from hard-disk controllers that speed access time to linear predictive coding processors for speech recognition.

With these new ICs driving personal computer design, we'll soon see machines we once only reasoned would exist: diskless computers running a wide array of software loaded over telephone lines; computers that display text exactly as it will be printed, with justified margins, superscripts, subscripts, and bold and italic typefaces on screen; and systems with better, more accessible graphics.

As computer design is simplified by these advanced ICs, product differentiation will become greater. This portends the death of those PC clones capable only of basic spreadsheet and word processing operations. Instead, to survive in the increasingly cost-competitive, standardised personal computer market, small-system manufacturers will tailor their products for niche markets.

Intel Corporation, located in Northern California's renowned Silicon Valley, is one of the largest and most innovative chip manufacturers in the industry. IBM has been committed to Intel products for years; the PC is built around Intel's 8088 microprocessor and, as recently as late last year, IBM invested $US225 million in a minority share of Intel stock.

A commitment this size is a good indicator of IBM's faith in Intel products. IBM's good faith and multimillion-dollar investment is guaranteed by Intel's long-standing promise that software written for the 8088 will run on all its future processors.

By taking a close look at the Intel ICs, we can gain valuable insight into the capabilities of the IBM PCs that will be built around them. The design philosophy of Intel's IC family differs radically from that of competitors Motorola, National Semiconductor, and Zilog. Diverse chip designs mean that the system designs of the IBM PC and its competitors, such as Apple's Lisa (based on the Motorola 68000 microprocessor), will also be radically different.

Of the many Intel chips being produced, some will have a greater impact on the computer industry than others. In the vanguard will be the new microprocessors.

Design of the PC was shaped by IBM's surprising selection of the 8088. This choice caught most industry observers off guard since IBM, also the world's largest semiconductor manufacturer, had traditionally used its own designs for computer logic. Once Big Blue settled on the 8088, Intel's design philosophy was firmly implanted in the PC — from the 8088's segmented memory scheme to its 16-bit registers and 8-bit bus.

Like the 8088, each of the four microprocessors Intel is now readying for production could dramatically influence the design and performance of tomorrow's PCs. The recipe for putting an entire central processing unit (CPU) board on one chip is easy.

80186

Take an 8086 (the 16-bit bus big brother of the 8088), speed it up, and then add most of the support chips essential to making the 8086 run in a personal computer. Reduce the size with the help of computer-aided design until all the chips fit on to one sliver of silicon, and you have the 80186 (186), an entire motherboard on a chip.

While firming plans for full-scale production of the 186, Intel is providing samples of the chip to computer manufacturers, including MAD Computer and Durango Systems. The rewards for using this newest chip are many: manufacturing costs are cut since a single IC is less expensive to buy than a boardful of them; physical CPU size is reduced, opening the way to shrink overall computer size or to put more power in the same box; and development time is cut for computer designers, which means considerable savings for system makers.

If the 186 is too rich for your taste, the 80188 (188) may be more suitable. As with the 186, the 188's core CPU and support chips are melded on a single IC; like the 8088, however, the 188 has an 8-bit interface to the outside world (the 186 has a 16-bit interface).

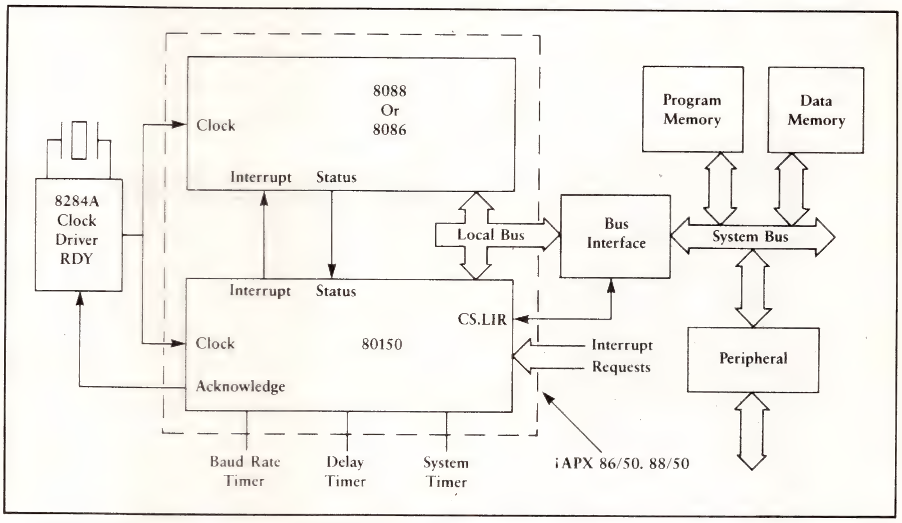
The 188 decreases costs by allowing computer manufacturers to use less expensive 8-bit peripherals. Although the 186 has received more publicity so far, the 188, aimed squarely at the massive 8-bit computer market, is expected to be used in greater numbers, at least in the short term.

80286

Powerful multiuser systems will benefit the most from the 80286 (286), possibly the most powerful microprocessor commercially available to date. Squeezing 150,000 transistors on a chip, the 286's designers have integrated a pair of HMOS-III (Intel's own proprietary process technology) 8086s and numerous other very large scale integration (VLSI) components.

The resultant chip is two to three times faster than the Motorola 68000 even though both chips can address about the same amount of memory. The 286 has very high speed (1.5 million instructions a second or five to six times faster than the 8086), about 16M-bytes of addressable physical memory, the ability to adddress a virtual memory of 1 gigabyte per task (equal to the capacity of 100 IBM XT Winchester drives), and the ability to provide several layers of multiuser security on chip.

Although a 4 MHz version of the 286 is available, deliveries of a 10 MHz version have been delayed until later this year. The complex timing of a microprocessor's operations is set by a clock reference. A 4 MHz microprocessor runs roughly 40 per cent slower than an equivalent chip with a 10 MHz clock.



Block diagram of Intel's CP/M on a chip with 8088 or 8086 microprocessor.

80386

Not yet built, the 80386 (386) is promised for next year, but the release date may slide to 1985. If the 286 is vastly more powerful than the 8088 or 8086, then the 386's potential is staggering.

Complementary metallic oxide semiconductor (CMOS) process technology, which lowers power consumption, is being used to build this 32-bit chip. Intel, Motorola, and National Semiconductor are already jockeying for position in what will be an intense competition for the 32-bit market.

Motorola is claiming that its 68020 will be the first widely available 32-bit microprocessor when it is introduced later this year, although NCR has already scooped the industry with its 32-bit chip. Hewlett-Packard, not to be outdone, has put 450,000 transistors on a single proprietary 32-bit microprocessor, which is used in the $US30,000 HP 9000 work station.

How will these processors affect the personal computers that use them? The most obvious effect will be faster performance.

Even the budget model 188 boasts two to five times the instruction and execution speed of the 8088 in today's PC. A 286 is about twice as fast again as the 188, and next year's data-gobbling 386 will have more speed than anyone can immediately use.

Since the 188 is ideal for low-priced portable computers, it creates the ironic probability that a PC-compatible portable may soon be available that will run the IBM PC's full line of software and run it faster than the full-sized PC.

80150

One chip ready to plug into the next generation of personal computers is the 80150 CP/M software-in-silicon operating system. A complete CP/M-86 operating system is stored in ROM on this chip, along with drivers for input and output devices.

Use of 80150 CP/M chip will eliminate the traditional booting up procedure of loading an operating system disk and reading its contents into operating RAM. Instead, the user will simply turn on the computer and press a CP/M-86 button. Again and more importantly, this chip lowers overall computer production costs since a disk drive and attendant control circuits are replaced by a solitary chip.

Another chip, similar to the 80150, has Intel's proprietary RMX operating system in silicon. This little-known RMX chip is also suitable for present and future IBM PCs.

Many people question the wisdom of putting software in silicon "Software should be soft," says Bill Gates, chairman of the board at Microsoft. He points out that operating systems are constantly updated; for instance, Microsoft will soon offer a revised version of MS-DOS that supports networking. Such updates can't readily be added to a hardware production line and certainly won't help the ROM chips already in users' computers.

Still, Intel argues that its choice of CP/M makes the 80150 practical. "We picked CP/M because it is a mature operating system," says Intel's product marketing engineer for software on silicon, Carl Buck.

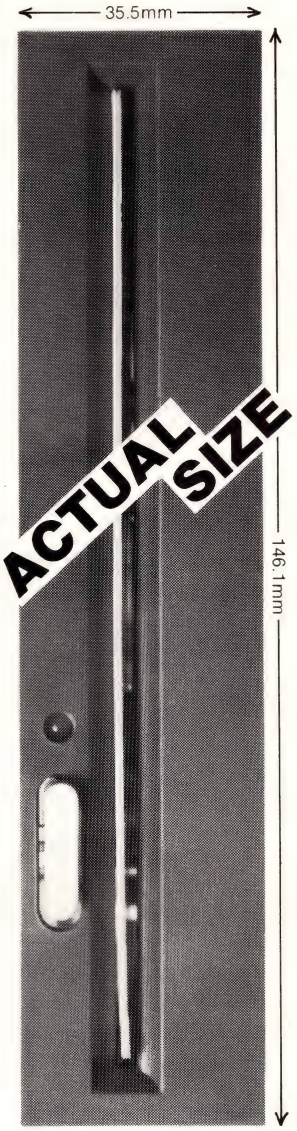
"We'd have more difficulty with a less developed product." The many versions of MS-DOS helped eliminate that operating system from consideration. Yet, according to Digital Research president, John Rowley, Intel left some room on the 150 chip to add to CP/M in the future.

Use of the 150 CP/M chip doesn't preclude the use of other operating systems. PC-DOS could still be loaded into a system and run, making use of the 150's input/output drivers.

Having software on silicon opens the way for very powerful diskless portable computers. The minimum configuration for a 188-based unit with the 80150 CP/M operating system could include one or two Basic applications programs in ROM, providing spreadsheet and word processing power in a unit the size of a keyboard with a small flip-up screen. Intel product marketing engineer Tony Zingale suggests we may soon see truly usable portables selling for $US500.

The space created on the motherboard by the 80186 and friends will

LOW COST
ULTRA SLIM
5¼" FLOPPY DISK
DRIVES



- 4/5 width of other slimlines
- Double Sided
- Double Density
- 96 TPI
- IBM Capacity per disk
- 3ms step rate
- Direct Drive
- Brushless Motor
- Disk Eject
- Ready Logic
- Head Load Logic

Manufactured for:
AUSDATA
PTY. LIMITED
Unit 1/175 Gibbes St,
CHATSWOOD,
N.S.W. 2067.

Phone
(02) 406 5755

Enter K025 on Enquiry Card

enable computer designers to add more graphics capability to their systems. Like the 80150 there are co-processor chips ready for the task.

82720/82730

A pair of Intel ICs, the 82720 (720) graphics display controller and the 82730 (730) text co-processor, are touted as providing vastly enhanced and simplified displays. With the 730, text can be displayed on the computer screen as it will be printed out. Italics can be mixed with straight text, and superscripts and subscripts are shown without the annoying and often misleading arrows common on today's software.

Editing can be speeded up by the 730's support for split screens, multiple windows, dual cursors, smooth scrolling, and table-driven linked lists. Displays of up to 200 characters per row and 128 lines a screen can be supported, and unique character sets, such as Arabic or Japanese, can be built.

Even more capability can be added through the 720, an IC that works with or without the 730. Introduced in September, 1982, the 720, a joint effort between Intel and NEC, is said to be integral to graphics plans for NEC's 8086-based Advanced Personal Computer.

One application in which the 720 and 730 will shine is opening windows on-screen. Most computer users are familiar with the ability of Apple's Lisa to link spreadsheets, graphics, and word processing through multiple displays, or windows, on one screen.

Lisa uses memory-hungry software and dedicated hardware. Apple's initial release uses 1 full megabyte of RAM, and Lisa will soon be offered with 4M-byte of internal memory in addition to a mandatory 5M-byte hard disk.

For comparison, the IBM PC, limited by the range of the 8088, can address 1M-byte tops. Visicorp's Vision promises Lisa-like graphics and program-linking capabilities for the IBM PC, with lower memory demands and no dedicated hardware other than a mouse. Although Vision supposedly runs faster with an 8087 math co-processor, Visicorp will not comment on whether its software will make use of the 720 or the 730.

Both Lisa and Vision use bit-mapping, a process that the 720 and 730 are said to simplify. In plain words, to create an image on-screen, the electron gun that illuminates the screen must be positioned and then turned on and off.

Data to do this is stored in RAM as a bit-map memory corresponding to positions of pixels lit on the screen. For one-level monochrome displays, one memory bit describes each pixel; for color and levels of grey, several bits must be used to describe each pixel.

Creating images is a lengthy chain of simple operations. In a system that uses the 8088 alone, the microprocessor is heavily burdened and the software runs slowly.

Using complementary chips to take up part of the processing chore will speed up the process considerably. This is where the 720 and the 730 come in. By doing tasks such as looking up and manipulating a library of commonly used figures, quickly accessing the bit-map memory, and rewriting the bit map, both chips speed text and graphics operations.

Use of the 720 and 730 demonstrates Intel's design philosophy and how this philosophy impacts the IBM PC. Computers such as Lisa that are based on the Motorola 68000 have a flat memory, while computers based on the 8088 or 8086 use segmented memory.

According to Intel, segmented memory works better for text and graphics manipulation than its flat counterpart. Ordinarily in processing any string of characters, changing a single letter in a string of text means repositioning every character.

But since segmentation uses pointers to locate data in memory, only the pointers locating the beginning and the end of a passage of text have changed. Similarly, pointers in memory can be used to position bit-map data corresponding to multiple windows on-screen, eliminating the need to recalculate and manipulate the entire bit map. Segmented versus flat memory has become somewhat of a religious issue in the semiconductor industry.

As long as the hardware keeps growing rapidly, users will have a continuing stream of improved computers. The variety seems endless and next year's crop exciting. □

Have you ever considered that you could need more than a personal computer?

NOW OPEN
Dicker Data Business Computer Centre
at 261 George St, Sydney.
(opp. Australia Sq.)
Vector 4,
software, books, magazines,
and knowledgeable advise.

The Vector 4, The Company Computer, is more than a personal computer, because a personal computer by itself won't solve your business problems. The Company Computer is a total concept that will.

The Vector 4 has dual processors, combining the power of the 8088 16-bit processor with the existing 8-bit Z80B processor. In addition the Vector 4 comes standard with 128K of main memory using 64K RAM chips, and is expandable to 256K.

Vector 4 design innovations such as time shared memory, single chip video display controller, and single board construction allow more standard features, greater reliability and easier installation and servicing.

The Vector 4 is available in both floppy and hard disk configurations, making it as flexible as possible to suit your needs.

The Vector 4 can also be networked with other Vector 4's, so everyone is always working with the latest, up-to-date information, utilising inexpensive telephone wire. Up to 16 Vector 4's can be linked together in a flexible and expandable multi-user system.

Ergonomically designed, the Vector 4 is at home in the most sophisticated and demanding user environments.

Vector Graphic is a hardware manufacturer with a strong commitment to software development. Memorite III- Word Processing and Execuplan II- Financial Modelling are included in the Vector 4 package.

Dicker Data have been selling and servicing Vector Graphic products for 5 years. Vector were one of the first companies to enter the microcomputer business. Our experience is invaluable to first time users or advanced programmers.

VECTOR
THE COMPANY COMPUTER.

For more information contact:

HEAD OFFICE: Dicker Data Projects Pty. Ltd. 78 Captain Cook Drive, Caringbah. N.S.W. 2229 (02) 525 2122,
DICKER DATA BUSINESS COMPUTER CENTRE: 261 George St, Sydney. 27 6662
N.S.W.: ALBURY — 21 3926, CHATSWOOD — 411 1892, COFFS HARBOUR — 52 4077. **VICTORIA:** HAWTHORN — 818 0794, PORT MELBOURNE — 64 1372. **ADELAIDE:** 223 4950. **WESTERN AUSTRALIA:** LEEDERVILLE — 381 4444, VICTORIA PARK — 362 4249. **QUEENSLAND:** 391 9209.

Enter K024 on Enquiry Card

Here's what makes this TeleVideo Personal Computer so attractive:

More memory. 64K Bytes of memory are included as a standard feature. (Additional memory is also available).

Easier on the eyes. The non-glare screen and sharp resolution make it easier to read charts, graphs, characters and numbers.

More reliability. Vertical cooling tower keeps the computer cooler so it'll perform better and last longer.

More workspace. Video screen is 20% larger than the standard screen, so you don't have to strain to see your work.

More applications. Because the TeleVideo personal computer uses CP/M® software, no other computer has more software applications than TeleVideo.

Graphics. A wide variety of advanced business graphics can be displayed on TeleVideo's special screen.

More storage. The standard two 370 Kbyte floppy drives are enough to accommodate growth in the future.

Easier to read. Tilting screen adjusts up and down to natural line of sight.

Easier number manipulation. Standard calculator keyboard is more familiar, so you can work faster and make fewer errors.

The TeleVideo SuperMouse.™ By moving the SuperMouse on the pad, you can control computer functions without the use of complicated keyboard codes (optional).

Easier to Use. Detachable keyboard moves anywhere on your desk, or even onto your lap.

Less exhausting. Unique palmrest lets you rest your hands while you're working.

Compact. TeleVideo takes up very little space on the desk.

Here's what makes it irresistible:

$3995.00 (ex. tax)

The TeleVideo TS 803 personal computer has everything other leading personal computers have, and then some.

In fact, some of TeleVideo's easy-to-use features can't be found on any computer, no matter how high its price.

Which makes our low $3995 price doubly attractive.

So why resist?

Before you buy any personal computer, look into the family of TeleVideo personal computers and personal computer networks.

DP

data peripherals pty ltd

9 AVON ROAD, NORTH RYDE, N.S.W. 2113, AUSTRALIA
PHONE: (02) 888 5733 VIC. (03) 598 5111 QLD. (07) 287 1200
NZ (09) 49 1303
Incorporated in N.S.W.

SuperMouse is a registered trademark of TeleVideo Systems, Inc. CP/M is a registered trademark of Digital Research, Inc.

Enter K022 on Enquiry Card

All You Want in a Computer At a Price You'd Never Expect

Introducing the New TRS-80® Model 4 Personal Computer From Tandy

**64K Model 4
With Two Disk Drives 3299.00**

Cat. No. 26-1069

- High-Performance 4 MHz Z80A
- Runs Thousands of Model III TRSDOS®, LDOS™ and CP/M® Plus Applications
- 80-Column by 24-Line Video Display With Upper and Lower Case
- 64K RAM Is Expandable to 128K — Use it As a Super-Fast RAM-Based "Disk Drive"
- Advanced Job Control Language Allows Completely Unattended Operation
- Sound is Accessible From BASIC or JCL
- Includes Print Spooler (Disk or Memory)
- 70-Key Keyboard Includes Datapad, Plus CONTROL, CAPS and 3 Function Keys
- New Microsoft BASIC Includes CHAIN And COMMON for Larger Programs
- Communications Package Allows Model 4 to be Used As Host or Terminal
- Forms Control, Routing and Linking, and Filtering Using Advanced TRSDOS 6.0
- Reverse Video Highlights Corrections
- Options Include 640 x 240 Graphics, Hard Disk System and CP/M-Plus*

With its new advanced operating system and Microsoft® BASIC, Model 4 is already an amazing value. But consider these other built-in features: two 184K, 13.3cm double-density disk drives, hi-res green screen monitor and parallel printer interfaces. Don't pay more later to add these features to another personal computer. We **include** what most charge extra for!

See the fantastic new TRS-80 Model 4 at your nearby Tandy Electronics store, Computer Centre or participating dealer — today.

**Tandy
ELECTRONICS**

The biggest name in little computers®
A DIVISION OF TANDY CORPORATION

Send me a free TRS-80 Computer Catalogue.

Mail To: Tandy Electronics Limited, Advertising Department, 91 Kurrajong Avenue,
Mount Druitt, 2770.

Name: ______________________

Company: ______________________

Address: ______________________

P/C: __________ **Tel:** ______________________

TAL983

*Available soon! Retail prices may vary at individual dealer stores. LDOS is a trademark of Logical Systems, Inc. CP/M-Plus is a registered trademark of Digital Research, Inc. Microsoft is a registered trademark of Microsoft, Inc.

Enter K005 on Enquiry Card

Where are the good, 'powerful' ideas?

Unless we mobilise the 'good ideas' in computing education, we will become submerged in the secondrate and worse as the cost of hardware ceases to be a constraining factor. But if we do it right, the 'good ideas' will become part of our everyday environment.

Tony Adams

RECENTLY I was shown an *Age* newspaper feature from 1967 on the impact of computers. The accompanying photograph showed an operator huddled over a seemingly immense IBM 1401, a machine with, I guess, comparable power to modern micro-systems, even if it had a lot of data storage. Among the many fairly amazing predictions was one that teacher unemployment would result from the introduction of computers in schools.

It hasn't happened, of course, and the prediction that it is even likely seems to most of us now to be fairly absurd. Not only have computers not replaced computers, they haven't really had much of an impact on education at home or at school at all.

The reasons why this is so are, I think, fairly clear. First of all the number of good ideas that have emerged in computing education have been very few, so we have perhaps been lucky that the cost of equipment (the second reason) has until the last few years been too expensive for most schools or homes.

The paucity of good ideas remains true today, but the cost of equipment is declining so rapidly that hardware scarcity will within a small number of years vanish completely as a restriction. This simple and inescapable fact has enormous implications, for unless we mobilise the good ideas we will be submerged by the secondrate and worse.

One of the better ideas comes from the world of commerce. If you go into an insurance company or similar business you will find computer terminals spread around on desks and counters. Indeed in many small businesses the computer systems themselves will have been moved from their air-conditioned sanctuaries into a corner of the office.

Terminals and small computers are rarely these days placed in specially equipped rooms. Rather, they are moved to where the account clerk, the booking officer, the engineer and all the rest of the workers can use them.

In other words they are integrated into the fabric of the organisation. The bad old days of organisations being twisted and tugged to fit the demands of a computer have gone. Seymour Papert would call this a "powerful idea".

This "powerful idea" has not percolated far into education. The idea of a room full of microcomputers, each with a child working at a display, is a lingering reminder of a technology that has passed.

Picture a better idea. Three or perhaps four computers in a classroom, one connected to a large screen monitor for all to see. Children engaged singly and in groups, in activities that take them to the computer to test an idea, carry out a calculation or word process some work.

Later they move to bookshelves, to look up a reference, to a table to discuss, and so on. Later the teacher demonstrates, using a computer simulation of some physical phenomena such as the uncoiling of a spring or a chemical reaction. The simulation, full of graphics and feedback, inspires discussion and debate.

In other words, the computer has been integrated into the classroom in the same way it has been in business.

There is nothing revolutionary in the above view of a classroom. In fact, if you take away the computer and substitute more conventional things, it's how many good teachers work (even, dare I say, in the much maligned state school). The problem appears to be that the computer sometimes stands between ourselves and good old-fashioned commonsense.

In the home the same good ideas can prevail even in the face of the recent disaster of the TV.

The households I most admire tend to have in them lots of books. Not books designed to improve the decor, but ones with worn bindings, torn covers, gravy stains and scuffmarks, the signs of having been read, loved and hated. If a house is devoid of books I wonder what else it lacks.

The analogy between books and computers in the home is to me another "powerful idea". The computer becomes an integrated part of home life.

This is not a long-term "futurist's view". A recent survey I have read suggests that by 1987 every child in the US will own a computer.

Further, a recent Victorian government report states that in Japan there is no large push for computers in schools. This is so, the report suggests, because it is assumed that children will become completely familiar with computers in their daily lives.

Another good idea in education emerged with Logo — or rather, Logo is a manifestation of it. The idea of a com-

"I'll tell you what could be replaced by a computer — K to 12, that's what could be replaced by a computer."

puter doing something of interest for its target audience is novel in education, as is the idea of a language with no threshold or ceiling in its capabilities. More of Papert's powerful ideas. These good ideas surface in other areas germane to education at school or in the home.

A good example is the idea of using a word processor for educational purposes. Let me first say that I don't mean the use of machines to teach secretarial studies or keyboard skills. These uses can be justified on more pragmatic grounds.

I am talking about the use of the word processor as a tool in the creative process. At a recent conference Sandra Wills and I were bitterly attacked for suggesting that the idea of children using a word processor wasn't at all frightening.

Most people these days will, if they have a complex calculation to do, resort to a calculator, a tool suitable for the job. So it is with the word processor.

It seems to me that if children and other people are going to write effectively then they have got to be provided with tools for the job. They need a pad to write and scribble on, the ability to rub out and edit, a dictionary to assist with spelling and meaning and good models of written language to build by.

Of course all of these can be provided conventionally and only some will appear on today's microcomputer.

Strong evidence exists that with only conventional tools, the child is faced with difficulties that obscure the creative writing process. The tedium and trouble of writing with a pencil, of rubbing out and doing it again, cause barriers that needn't be there.

Calligraphy is a useful and important skill, but it is only a means to an end and should be treated as such. After all journalists and other professional writers tend to use word processors, so why not kids?

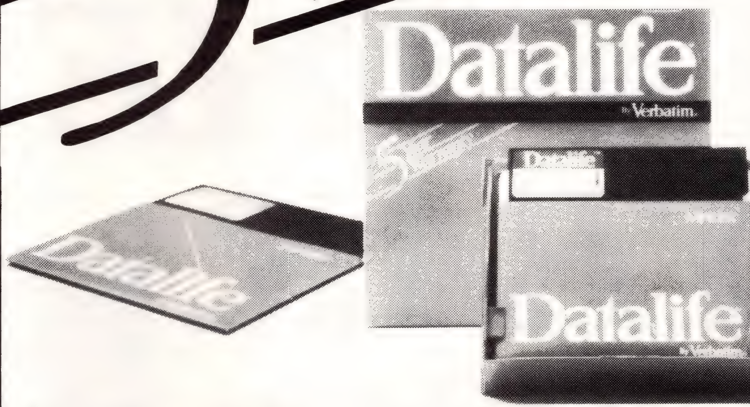
Other good ideas in computing education have relevance to school or home. To me all seem to have much in common. They are tools for discovery, for learning, for personal efficiency and often for fun.

They are open-ended both for the novice and the experienced, and above all they become a part of our everyday environments. We do not become part of the computer environment. ☐

magmedia magmedia magmedia magmedia

Datalife®

5 Year Warranty



Preserving your data is vitally important. Lose it and you've lost both time and money.

That's why it's vitally important to keep it on flexible disks that guarantee a longer life of trouble-free recording, storage and retrieval: Datalife® flexible disks with the 5-year warranty. That's 5 times longer than the industry standard. No wonder Verbatim is the standard of excellence in 8 inch, 5¼ inch and 3½ inch disks.

And when you think of excellence, think of Magmedia, the one-stop shop for computer media, supplies and accessories.

We have everything for your computer from floppys to furniture. Magmedia, the national distributors of Verbatim products.

magmedia
helping you make the most of your computer

SYDNEY	MELBOURNE	BRISBANE	ADELAIDE
(02) 428 1100	(03) 699 9688	(07) 229 1600	(08) 223 6261
CANBERRA	PERTH	HOBART	TELEX
(062) 47 2322	(09) 328 3311	(002) 34 4522	AA22703

Magmedia Pty. Ltd. Incorporated in N.S.W.

Enter K070 on Enquiry Card

JUST VOTED PERSONAL COMPUTER OF THE YEAR.

The Advanced Personal Computer.

The Personal Computer of the Year was chosen by a distinguished panel of judges selected by Your Computer Magazine. NEC will be happy to provide specific details of the judging criteria.

NEC Information Systems Australia Pty. Ltd.
(INC. IN N.S.W.)

NEC
NEC Corporation,
Tokyo, Japan

PHONE TOLL FREE 008 22 6344 (IN SYDNEY PHONE 438 2322)
FOR MORE INFORMATION ABOUT THE REMARKABLE NEC A.P.C.

Garland, Farwagi & Shillington NEC1135

Enter K006 on Enquiry Card

Personal Computer Software

16-BIT SOFTWARE AVAILABLE FOR ADVANCED PERSONAL COMPUTER

SOFTWARE

Category A:

Software sold by NECISA as the sole distributor of these packages on NEC personal computers. Full support provided by NECISA.

Category B:

Third party software with which NECISA is familiar and has demonstrated and tested and for which first line support may be obtainable from NECISA, but no warranty is implied. Product is obtainable from author or under certain circumstances, via NECISA.

Category C:

Third party software which is claimed to run on NEC Personal Computer products but which NECISA has not, as yet, fully evaluated.

Operating Systems

CP/M-86 Version 1.1	(A)
MS-DOS Version 2	(A)
P-SYSTEM Version 4	(A)

Languages

R.M. COBOL	(A)
C/BASIC-86	(B)
C.B.-86	(B)
PASCAL MT+/86	(B)
CIS/COBOL 86	(C)
DRI C 86	(C)
PL/1-86	(B)
SSS FORTRAN 86	(C)
RASM 86	(B)
CONTROL-C BASIC	(C)
SUPER SOFT C 86	(C)
PASCAL/M 86	(C)
JANUS/ADA 86	(B)
Computer Innovations C 86	(B)
MS-BASIC	(B)
MS-BASIC COMPILER	(B)
MS-BUSINESS BASIC COMPILER	(B)
MS-PASCAL	(B)
MS-FORTRAN	(B)
MS-C	(B)

Telecommunications

I.E. Asynch-86	(A)
I.E. Bisync – 80/3780	(A)
I.E. Bisync – 80/3270	(A)
MODEM 86	(B)

Word Processing

Benchmark Word Processor	(A)
Benchmark Telecommunicator	(A)
Benchmark Mail List Manager	(A)
Wordstar-86	(B)
Mailmerge-86	(B)
Spellstar-86	(B)
Spellbinder-86	(B)

Data Management

dBASE II 86	(A)
Dataflex 86	(C)
Condor 86	(C)

Productivity Tools

Access Manager 86	(B)
Display Manager 86	(C)
Diagnostics/2 86	(B)
Disk Doctor 86	(C)
RASM 86	(B)
Sid 86	(B)
VEDIT 86	(B)
Word Master – 86	(B)

Financial Modelling

Micromodeller	(C)
Microplan Spreadsheet	(A)
Microplan Business Planner	(A)
Microplan Consolidator	(A)
Scratchpad 86	(B)
Supercalc 86	(B)
Mars	(B)
MS-Multiplan	(B)
MS-Multi-Tool Budget	(B)
MS-Multi-Tool Financial Statement	(B)
Masterplanner	(C)

Accounting

IMS (Ascent) & (Executive)	(B)
Davidson	(B)
I.A.L.	(B)
Attache	(B)

PHONE TOLL FREE 008 22 6344 (IN SYDNEY PHONE 438 2322) FOR MORE INFORMATION ABOUT THE REMARKABLE NEC A.P.C. AND YOUR NEAREST DEALER

NEC

NEC Corporation
Tokyo, Japan

NEC 1135a

Enter K004 on Enquiry Card

This Disk could make your Business hop.

Buying a flexible disk for a computer is a bit like selecting blank cassette tapes.

There is a huge array to choose from. And the most difficult part is knowing which one to choose.

Because not all disks offer the same quality and durability.

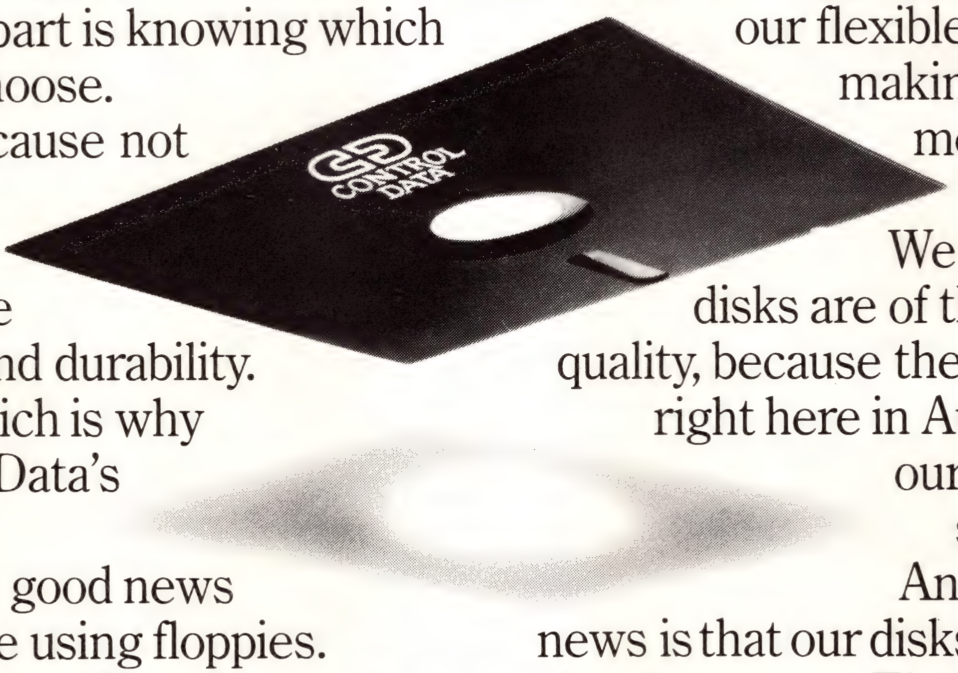
Which is why Control Data's flexible disks are good news to anyone using floppies.

Control Data is one of the world's leading computer and computer supplies manufacturers.

We have been supplying large disk drives and their media to other computer manufacturers for years. Now we offer everyone the opportunity to use our flexible disks by making them more widely available.

We know our disks are of the utmost quality, because they're made right here in Australia to our stringent standards.

And the best news is that our disks are great value for money. That means while your business is hopping it's also music to your accountant's ears.



CONTROL DATA AUSTRALIA PTY. LIMITED

(Incorporated in Victoria)

For your supply of Control Data flexible disks call:
MELBOURNE 555 9911, SYDNEY 923 9000, NEWCASTLE 26 1433, ADELAIDE 332 5077,
PERTH 367 6225, HOBART 20 4729, BRISBANE 224 9711 (DATASET)

Burrows Doble Lawrence CDA492/AMC

Battle for the briefcase

Home computers show they mean business

Norman Kemp

NOTHING succeeds like imitation, or so it would seem in the small computer market. Scarcely has Tandy unveiled its briefcase-sized Model-100 for electronic note-taking, breaking new ground for computers of that aize and range, than another Japanese manufacturer leaks the word that a similar and competitively priced product is on the way.

Although a NEC product which will be an enhanced version of the Model-100 has already been forecast, the newcomer is Sord, which has been quietly working on a manufacturing project in Singapore. Details are being kept very secret, but the machine is understood to have low power CMOS semiconductor chips to reduce battery drain, a 64K memory, an MS-DOS operating system and built-in software.

Recently in Australia, Tandy president John Roach predicted that in a few years calculators, as they are known today, would virtually disappear from the market and be replaced by small, low-cost computers. The coming generation of products appears to be among the first in this direction though they are currently in upmarket price brackets by comparison with the so-called home computer. This has not discouraged the trend for low-priced, so-called home computers to be upgraded.

Sord is ready for this one, too, and is preparing to bring to Australia a disc-drive version of its M5, which is now priced in basic configuration at $395. The enhanced version will have available 3.25in discs with 160K storage capacity, and slots for 5¼in disk drives. It will also run a 60cps 80-column thermal printer.

Basic language programs and educational software for the computer are being written in Japan, the UK, the US and in Australia. It is scheduled for release here, later in the year, at a price for an average confuguration of about $1200.

At the top end will be a 16-bit M68 processor, based on a 10mHz Motorola 68000 with 256K memory and designed for professional business applications. Announced at the National Computer Conference in the US last May, it is due to arrive in Australian in October and November, and will be demonstrated at the newly furbished Mitsui computer shop just off Hunter Street, in Sydney.

The Japanese have been lavish with their operating systems for this machine, providing six to obtain the widest possible software compatability. There is CP/M-68K, running Pascal, Fortran and C, a choice of BDOS, MS-DOS, UCSD p-System, SB-80 compatible with CP/M-80 packages and Sord's own KDOS.

Sord's SGL graphics language has a pallette function allowing up to 4923 colors with a high-resolution screen.

An optional SC88 card containing an 8088 16-bit cpu is provided for further software compatibility. The bonus is that it will also contain a 4mHz Z80A processor with 64K memory for eight-bit software, and 1M-byte floppy disks as well as hard disks drives will be available.

For this machine, Sord has developed an enhanced PIPS internal software package. PIPS is the great Sord secret weapon, distinguishing the machine on the market from others by providing integrated spreadsheet, database, graphics, text processing and programming functions mounted in a single system.

It is not exactly a novice's dream, but with practice a user can manipulate the screen for instant forecasting, analysis, data file management and other calculations with only one setting of the machine. Although this limits the user base to other Sord operators, the system has proved practical by experience, and one of the major customers is the vast Citicorp multinational financial group which has specified Sord for all its offices throughout the Asian and Australian region.

But Sord does not expect all the world to become a programmer, so it is offering a reasonable choice of other

The wonder of it all at "Educomp '83".

systems to appeal to a wider range of users.

A parent gets involved

AN APPEAL to increase school funding for computers has come from an unlikely source — not from self-interested computer companies but from a parent who has recently voluntarily organised an education display at a Sydney secondary school.

Don Wilson, in private life an adviser with a financial investment group, and with a son at Mosman High School, decided that the kids were not being given the opportunity to try out the school's computers to the full, and that within a year or so many of them would need to have more awareness and skills for the working lives than they were receiving.

Mosman High already had a couple of Apple IIs and three Microbees, and the parent-teacher group at first was not keen to spend more money in this area when there were other pressing needs. But Don argued that the committee was not being far-sighted enough, and he wrote to computer companies asking for support for an exhibition to be put on at the school, and to which pupils and teachers from other suburbs would also be invited.

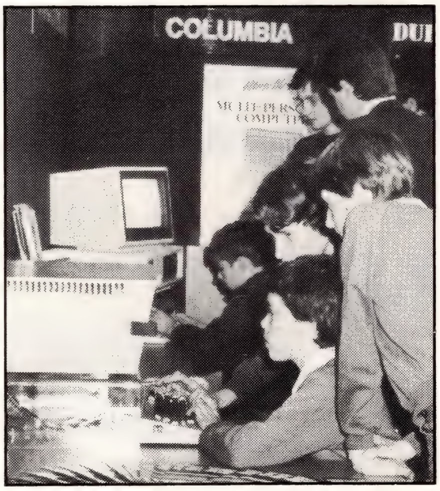
Surprise. A deadly hush — until he went to IBM Australia. A lunch meeting with then Director of Communications, John Harvey, produced a promise of support and $1000 to help finance the proceedings.

The result has been a three-day display with about a dozen computer companies participating — some not so well-known in the education field, while a couple of well-known names were unaccountably missing.

Was the experiment a oncer, or did it achieve a practical result? Don Wilson thinks it was worthwhile, and so does maths teacher Ron Clark, under whose charge are the Mosman High computers. Parents and teachers are rethinking their policies towards computers at the school, with one of the first objectives being to set up a computer laboratory to make the machines available to more pupils.

Don says he would like to see the amount of money spent on computers raised two or three times. Admitting that his idea is somewhat radical in view of the limited funds of many parent-teacher organisations, he believes that school purchasing should be regarded in a similar fashion to business buying. Schools should not be looking for cut-price bargains but should shop for the best equipment and software on the market, he says.

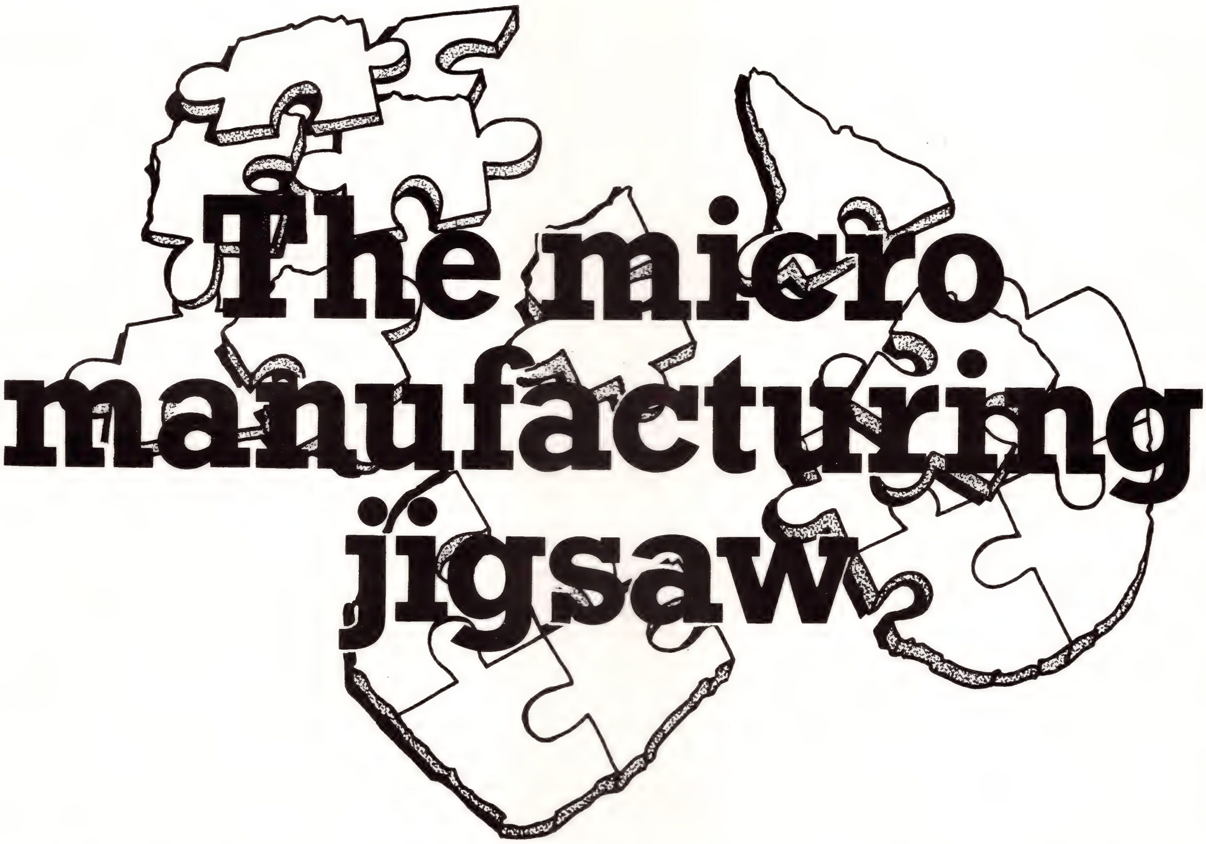
Some computer companies pay lip service to the education market, but resent its demands for goods and services at prices which are scarcely within the economics of their businesses to provide. This, says Don, should be squarely faced by schools, where allocations should be $10,000 or more to computer laboratories and not put in classrooms, raising the level of school purchasing to a higher degree.



Different schools have different funding problems, but more sharing of equipment between schools or joint efforts in moneyraising could overcome most of the problems.

Some teachers may not agree, but one of Don's key points in founding a computer laboratory is to ally it with the existing school library, and divert some of the money now spent on books into computer programs. He acknowledges there is competition from school libraries when computer purchases are discussed, but he contends that each has a similar aim in the school and their activities could be combined.

MICROFUTURE
A Division of
HITECH MANAGEMENT PTY LTD
Word Processing and Computer Consultants
Authorised Dealers for
NEC
COLUMBIA
KAYPRO
We provide quality products and professionalism. Come and discuss your business needs with our well qualified and helpful staff
MICROFUTURE
Unit 10, 300 Rokeby Road, Subiaco 6008, Western Australia. Telephone: (09) 382 2697.
Enter K007 on Enquiry Card



The micro manufacturing jigsaw

Are there enough pieces to complete the picture?

Australia has its success stories but the truth is that our micro manufacturing industry is miniscule by world standards. Nonetheless, there is one, and this survey of 31 companies goes a long way towards disputing the view that time has run out for the micro entrepreneurs. Their worst enemy is an anti-Australian buying attitude. In this special feature Tony Smith presents the players in an emerging industry.

AUSTRALIA'S computer manufacturers are entrepreneur-driven — names like Bill Caelli, Damien Dunlop, David Hartley, Mike Roberts and David Webster are a good deal more familiar than the products their companies produce. Yet those five companies dominate the foundations of the Australian manufacturing industry as well as doing a substantial part of its current business.

Classical entrepreneurs are the driving force behind almost every Australian manufacturing company. Its products were conceived and marketed by them, and the company is managed by their natural flare rather than any theoretical methods. They drive their enthusiastic staff towards the limits they demand of themselves.

Yet almost as part of their job these entrepreneurs become revered spokesmen for the industry, Caelli in support of many worthwhile causes, Dunlop organising solidarity through the likes of ACEMA, Hartley preaching the message of success beyond failure, Roberts proclaiming achievement and Webster the doctrinaire free trader.

The much maligned Australian computer manufacturing industry has been unintentionally summed up by a Geelong software house's delightful accounting interpretation package, ASK!

Like the industry, ASK! depends on irreplacable imported foundations, but manages to be uniquely Australian. The manufacturers import chips, disk drives, screens and operating systems.

ASK! was based on US research into the factors in company failures. Both the industry and ASK! are shining examples of Australians unique design talents.

But ASK! can also tell the story of most of our computer manufacturers. Fed with typical accounting figures for a small company, ASK! asks the entrepreneur what he could earn in stable employment and how much the money he has invested in his company could otherwise earn, then analyses the figures and displays its opinion: "Undoubtedly your company's greatest asset is you."

Yet the industry is much more than five individuals preaching a cause. AMM has identified more than 30 Australian manufacturers of general purpose computers and strongly suspects that at least another 10 companies have been taking steps to join those ranks, to say nothing of the growing band of component, peripheral and industrual control system manufacturers.

Despite the individual success stories, the Australian manufacturing industry is miniscule by world standards. Australia's ratio of imports to exports of computer equipment peaked at an unhealthy 40 to 1 early in the decade and recent reductions, mainly because of the increasing number of players, have lifted us to 22nd out of the 24 OECD companies in value of computer exports, ahead of just Greece and Portugal.

But this feature quickly disproves the notion that Australia does not have a computer industry, or worse, that it is too late for us to have one. Federal Minister for Science and Technology, Mr Barry Jones, has been extricating himself from those fallacies ever since he first promulgated them, but unfortunately, his new message has yet to overcome prejudices in key buying areas.

The apparently anti-Australian attitudes of buying officers in almost all government departments and large companies arise because those responsible fear for their own reputations. If they buy from IBM, DEC or Apple, it is easy to shrug off blame when something goes wrong, but if they do something as adventurous as supporting an Australian computer manufacturer, they run the risk of the judgement being seriously questioned.

Unfortunately for Australian manufacturers who are often very successful in commercial overseas markets, the US, UK and Japanese governments support their relatively successful manufacturers with solid preference policies. Most Australian manufacturers are throwing their weight behind efforts to force the government to give them comparable support.

Some of the larger Australian manufacturers of computers, as well as of communications equipment and peripherals, recently formed the Australian Computer Equipment Manufacturers Association (ACEMA) as a counterweight to the importers association — ACESA — at the recent IAC hearings into high technology.

To counter ACESA's massive funds, ACEMA was forced to set a relatively high membership fee, which has deterred some potential innovative members.

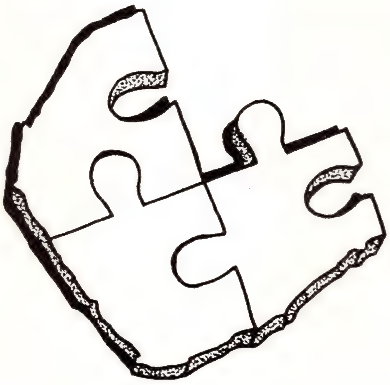
The continuing proliferation of local manufacturers illustrates the vast breadth of the total market for computers. There have been virtually no occasions when two Australian manufacturers have been competing for a well-qualified computer supply contract. Local contenders usually are up against several imported products.

The locally designed systems cover an extensive range of architectures and a variety of target market emphasis. Even in the relatively crowded areas of shared bus systems and accounting systems, each Australian supplier has a unique emphasis applicable to some specific user market segment.

By the end of the year, as announced systems get into production, it will be possible to find an Australian product which reasonably matches requirements in the overwhelming majority of orders of less than $A100,000. But, it will still be rare for two Australian systems to be equally suited to a particular requirement.

If a large number of potential buyers suddenly decided to buy Australian, the local manufacturers would take time to gear up to cater for the rush.

The conventional theory for the lack of success of Australian computers identifies problems in finance, marketing and management.



Limited venture capital is available because structural economic deficiencies make it a less attractive form of investment than it is in the US. The taxation of profits retained to fund growth limits the rate at which companies can grow self funded, which even the absence of a capital gains tax cannot outweight.

Marketing in Australia has been the province of individual entrepreneurs without the attitude of mind and professional approach indoctrinated into the most successful overseas companies. The handful of successful Australian computer marketing entrepreneurs (Bill Anderson, Julian Barson, Tom Cooper, Rudi Hoess and Lionel Singer), have yet to market any real Australian computers.

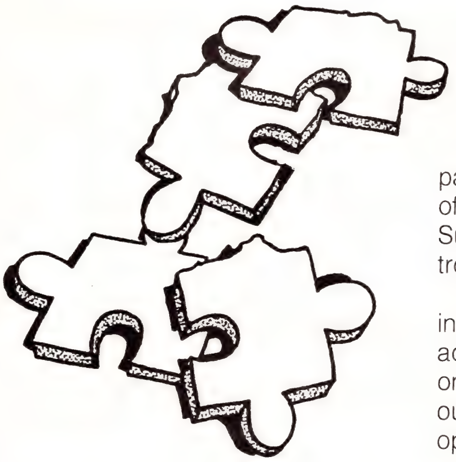
The difficulties of establishing a productive co-existence between entrepreneur and professional management have not yet been properly overcome in any Australian computer company.

Despite the growing horde of Australian manufacturers, only a few are producing equipment which gets any real recognition in the marketplace:

☐ Mike Roberts's Time Office Computers, after reportedly expanding $US2.5 million of venture capital the first time around has established recognition through a solid advertising campaign. While the individual Time workstations are not exactly the latest design of the pioneering Australians, Time has stayed closest to the leading edge through emphasis of its E-Lan network.

☐ DD Webster's Spectrum and Digital Electronics became possibly the two most similar Austrtalian manufacturers by basing their products on DEC's dominant PDP-11 minicomputer architecture, with Websters becoming an important supplier to software OEMs, particularly in Melbourne, and Digital Electronics achieving comparable recognition in Sydney.

☐ Damien Dunlop's Computer Manufacture and Design (CMAD) developed its own unique minicomputer architecture and then produced a substantial range of applications software which became CMAD's true market strength.



- David Hartley became an industry identity on the basis of his company's software packages for client accounting. Only when he tired of paying the price of building on imported equipment did he decide to risk, and for a short while lose, all on a powerful 8086-based system designed to host his software.
- The most recent and possibly most widely recognised Australian designed product is Applied Technology's Microbee, the only Australian entrant in the consumer computer rat race. It has sold mover than 10,000 units locally, keeping its Gosford assembly line flat out and leading to the strong possibility of additional lines in other cities. Microbee has won a dedicated low-end hobbiest following reminiscent of Apple's early following higher in the market.

Picking products likely to be the success stories of next year is an unenviable task. Finance, marketing and management count more than simple design. Dulmont's truly portable Magnum has its leading-edge design married to the even greater strength and marketing muscle of Tom Cooper's President chain.

L & L Australia's Unison has several advantages which could make it the biggest success of 1984 if it can avoid the threat of the world passing it by. The 12-month build up of expectations for Unison, Unix and the 68000 has the market primed.

Now fully owned and managed by Email, L & L's management need not be comprimised by entrepreneurial style. And it has the financial muscle and most of the production capacity to cater for any conceivable level of market demand.

If potential market size has any impact on success then Australia's first portable, Amust, should be able to get a useful nibble of the market dominated by Kaypro and earlier Osborne.

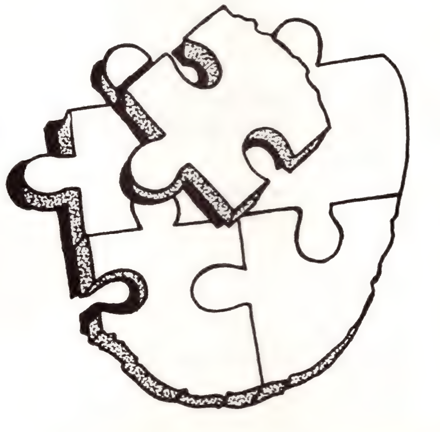
Design excellence is playing a major part in the growing market recognition of Labtam and of the Universe Supercomputer from Acoustic Electronic Devices (AED).

Both companies arose from different instrumentation areas and have achieved some export business based on dragging maximum performance out of Intel processors and the CP/M operating system family.

Clearly, the most successful Australian computer product in the area of niche markets is the Fairlight Electronic Musical Instrument (EMI), the stripped version of which was sold as a general purpose computer called Qasar for a couple of years to keep the production facilities fully employed. EMI has become so successful, with sales to such musical identities as Paul McCartney, that Fairlight has been able to concentrate solely on its production and distribution to a market 80 per cent of which is overseas.

Fairlight has found Australian government research and development grants and export incentives to justify continuing to manufacture the world's most advanced musical synthesiser, at Rushcutters Bay in Sydney.

The new leading edge of Australian computer technology looks like riding on the wave of the "multiwire" alternative to printed circuit boards, supplied by Circuit Technology of Perth. The CAD/CAM system used to produce board wiring from sketch diagrams and component specifications gives a turnaround time of about six weeks from product conception to prototyping. It avoids the high cost of multilayer printed circuit-board design for complex boards and is particularly cost competitive for the small volumes needed to make an entry to the Australian market.



Two companies using Multiwire to produce leading-edge systems are The Dewhirst Corporation and Canberra-based Ortex. Dewhirst's "intimately coupled" shared bus database machine is aimed to provide unprecedented throughput levels for multiuser data processing using proven software.

Ortex expects in October, to release a multiple 80286-based machine able to connect a theoretical maximum of 256 users which should outperform Convergent Technology's much-publicised Megaframe. Ortex is also using the fast turnaround to design a computer to improve the performance of its computer-aided design system for designing future computers — first signs of the next exponential leap.

Every company in the industry has some story to tell which adds to an impressive total picture, none more than those which have won a viable market share with little fuss.

Datamax has built more than 300 attractively packaged Z80, 8in, CP/M units profitably enough to operate out of its own premises within a stone's throw of the Manly Corso in Sydney. Its sales include large numbers to two Australian universities and exports to China. Its designers are working on a superior fully compatible version of the IBM PC for release about the end of the year.

A similar number of units have been delivered by a Sydney city manufacturer, System One, by getting maximum performance out of a Z80 processor with its own unique time-sharing operating system and suite of proprietary accounting software. The group has taken the Australian tradition of pushing hardware to its limit to produce an economical system for anyone who wants multi-terminal accounting without the option of general computing.

Arguably, the classic Australian system was released last April by Macpro of South Melbourne. A shared bus machine, it utilises another Australian supplier, Pulsar Electronics' Little Big Board, STD bus, single board computer, and is packaged with Australian accounting software and locally built matching modern furniture to produce an elegant system, ready to move into a small business's front office. □

ONE COMPUTER BOTH 8

AUSTRALIAN COMPANY HAS MORE TO OFFER THAN INTERNATIONALS

THERE are a number of flaws in assuming that large international companies can provide a better product. In particular some Australian companies are able to provide support not matched by the "big guns" such as IBM, Apple, and Digital Corp. When phoning an IBM service centre can you speak directly with the people that designed the machine? Acoustic Electronic Developments, known nowdays as AED COMPUTERS have displayed an uncanny ability to provide superior product technology as well as service unsurpassed in the industry.

JUMP FROM PROGRAM TO PROGRAM — First for Australia

Previously CP/M-based microcomputers were only able to run one program after the other, resulting in their inability to reach full potential in minute-to-minute business activities.

Analysing small busineses it becomes apparent that businessmen are required to swap randomly from function to function. One moment they are production controllers, the next, sales persons, next the accountant, etc. By the very nature of office life they seldom finish one task before being interrupted by one more urgent.

The microcomputers inability to rapidly swap from function to function has been overcome by a revolutionary new operating system concept (MPS Multiple Program Selection) developed by AED. At a touch of the keyboard the current task is saved in suspended animation. The user then selects one of nine other tasks, which complete with its screen image, is loaded into the computer and released. The swap takes only six seconds (about 20 times faster than conventional systems). When done with the new task the operator returns instantly to the original.

Swapping programs on conventional microcomputers is slow, requires many keystrokes, and normally there is no menu prompting. MPS, however, is extremely fast, requires only three keystrokes, and is completely menu assisted. Other attempts have been made to solve this problem by creating a fully integrated suite of programs. This approach yields an improvement though still suffers slow swap time and only specially written programs are available for the system. MPS resides in the operating system, therefore offers extreme speed and is compatible with any standard CP/M program.

SUPERAED — The CP/M your having when your not just having CP/M

In the first two years of manufacturing microcomputer systems AED became aware of many features that were not provided by the popular CP/M operating system. This shortcoming was holding back microcomputers from reaching their full potential in business, office automation and engineering applications.

Analysing alternative operating systems revealed that some had advantages in some areas but still lacked the end-user oriented features that were of primary concern. It appears that computer system programmers give total priority to hardware, disk file structures, programmers facilities, and the command power to impress engineers and technicrats. This explains why these operating systems, while more powerful, still lack the basic facilities that would make the computer infinitely more useful to the businessman, engineer, doctor, etc., that use it from day to day.

Solving this problem by designing a new op-system was due to the incredible software base available for CP/M. Other company's CP/M look-a-likes all have compatability problems and AED didn't want to join the list. The alternative of developing an extension package to CP/M was adopted with some startling results, all achieved without corrupting one byte of CP/M or it's CCP.

After 12 months in development AED released SUPERAED which was an immediate success leading to increased sales of the "AED SUPERCOMPUTER I" and drew considerable interest overseas. After a further 18 months development a new version with a unique multiple program selection capability (MPS) was released, along with a new computer "AED UNIVERSE Supercomputer II" which combined 8 & 16-bit operation in one machine.

Superaed provides many features unique to a CP/M-based system including:

Intelligent Terminal Driver. A special driver for the extremely fast AED UNSERIAL terminal, providing display speed control and intelligent software control over cursor and all screen characteristics.

Keyboard Substitution. Allowing application software to talk to the computer as though it were the operator. At last one program can use another to participate in the job at hand.

Automatic background memory testing. SUPERAED continuously scans the computers memory, warning the operator of any faults before they cause subtle data errors to creep into your files.

Selection of multiple printers. CP/M provides for only one printer. "SUPERAED" provides for 8 printers which may be selected directly from the keyboard or under software control. Orders can be automatically directed to a printer loaded with order forms, invoices to a printer with invoice forms, etc.

A powerful diagnostic monitor. This is one of the most startling features of "SUPERAED". Unlike other systems the monitor can be entered even when a CP/M program is in use. After using the monitor for diagnostics, experimental, or debugging purposes, you can return right back to the CP/M application. At last you can look deep into the software and hardware system of your computer while the sample is still under the microscope.

OPERATING SYSTEMS — TO GO

The majority of microcomputer systems have either 8-bit 8080, 8085, or Z80 CPUs or 16-bit 8086 or 8088 CPUs. The CP/M operating system has been adopted internationally as the standard for 8-bit machines. CP/M-86 and MS-DOS operating systems share the market for 16-bit machines. Owners of 8-bit machines are limited to 8-bit CP/M software of which there is an abundant variety. Owners of the technically superior 16-bit machines have access to a respectable, yet somewhat more limited variety of software. Choosing which machine to buy can become a nightmare when weighting-off performance, software availability, and the future. The AED UNIVERSE computer simplifies this choice offering the best of both worlds. By employing a software selectable dual 8 & 16-bit CPU the UNIVERSE can run all of the most popular operating systems; CP/M, MP/M, I/OS, Multi/OS, CP/M-86, MS-DOS and more to follow. This approach opens the door to a wide application software range than almost any other computer system. AED are planning to release

(ADVERTISEMENT)

& 16-BIT

additional bus master CPUs such as 68000, 16032, and 80286, extending even further the range of operating systems available.

HARDWARE — Built for speed and expandability

The AED UNIVERSE electronics is based on a 20 slot IEEE 696 S100 bus structure. This is the only bus endorsed by an international standards organisation. There are many systems that claim compatability with this standard but beware as compatability with and compliance to IEEE 696 mean two different things. An S100 system has many advantages over integrated proprietory systems as it offers greater expandability as products are available from a broad range of vendors. S100 tends to be the first to introduce new technology in a practical form and offers the greatest performance cost ratio.

The universe uses a dual 8 & 16-bit CPU which boasts the highest clock speeds available, that is 6MHz on the 8-bit and 8MHz on the 16-bit. The systems memory cards work in both the 8-bit and 16-bit modes making extension of the system to future 16-bit and 32-bit processors viable. The UNIVERSE employs intelligent Direct Memory Access (DMA) temporary bus master floppy and hard disk controllers employing there own processors to remove burden from the system CPU. This technique yields speed far exceeding systems from the large corporations.

Printer and communications input and output are handled by what must be the most powerful I/O system ever offered on a microcomputer system. This card has its own on board Z80 CPU combined with 256K-bytes of memory to dynamically buffer all input and output from the two centronics and two programmable serial ports. The card also boasts a clock calendar, programmable interrupt system, programmable counter timers, and a unique power supply monitoring system.

The UNIVERSES terminal is part of the computers main memory system making it several times faster than conventional serial terminals. In fact, the UN-SERIAL terminal is so fast that under WORDSTAR word processing software the UNIVERSE performs more like a sophisticated dedicated wordprocessor than a normal computer.

UNIVERSE

SUPERCOMPUTER II

SLOW: Non standard 5¼" discs.
SLOWER: 16 Bit only C.P.U.
LIMITED EXPANDABILITY: Cards from only a small number of manufacturers.
FEWER APPLICATION PROGRAMS: Due to 16 Bit only C.P.U.

FASTER: 6 & 8 MHz 8 & 16 Bit dual C.P.U.'s.
MORE APPLICATIONS: via CP/M, CP/M-86, MS-DOS, MULTI/OS, & MP/M-86.
HIGHER SPEED: 8" 1.2 MEG DMA Floppy & DMA 16 MEG hard disc fixed & removable.
MORE EXPANDABLE: Due to S100 IEEE 696 compliance from hundreds of manufacturers.
THE ONLY SYSTEM with the magnificent 'MPS' INSTANT TASK SWAPPING CAPABILITY.

DEALER FRANCHISE ENQUIRIES for BRISBANE, ADELAIDE & PERTH WELCOME!

We can help you with:
• CONSULTANCY • SERVICE CONTRACTS • CUSTOM SOFTWARE • STANDARD SOFTWARE

The choice is yours.

AED Contact AED for your local dealer or information kit.

For details or an information kit contact:

Sydney: AED COMPUTERS, 24 Darcy St, Parramatta, NSW 2150.
Phone (02) 689 1744, (02) 681 4966. Telex AA70664 GIRFRI.
Melbourne: AED COMPUTERS (Melbourne): ELSTON COMPUTERS PTY LTD,
53 Waverley Road, East Malvern, Vic. 3145.
Phone (03) 211 5542. Telex AA30624 ME447.
Canberra: AED COMPUTERS (Canberra), 217 Northbourne Ave, Canberra, ACT 2601.
Phone (062) 47 5348. Telex AA62898 HARSUR.

SUPPORT more the merrier

Engineering and service support for AED systems is second to none in the industry. Phoning an AED sales and service centre puts you in contact with engineers rather than salesmen. Usually the engineer was involved in one or more aspects of the machines electronic or operating system design. Few if any multi-nationals can offer this ready access to engineering support. AED has chosen as agents, engineering companies involved in sales instead of sales companies involved in engineering and provide complete engineering service and sales support in Sydney, Melbourne, and Canberra, and intend to soon include Brisbane, Adelaide, and Perth.

AED can provide complete System analysis and consultancy. SOFTAED a Sydney-based division of AED produces custom written applications where off-the-shelf software is not suitable. AED installs the systems and provides any necessary training.

Service contracts are available covering most of NSW and Victoria. AED were one, if not the first computer company in Australia to provide a one-year warranty, a true reflection of the reliability of the machines and the companies belief in them.

(ADVERTISEMENT)

Enter K036 on Enquiry Card

ABACUS

Abacus International Pty Ltd
512 Bridge Road, Richmond, Vic, 3121
Telephone: (03) 429 5844
Systems: Century 500, 800, 1000, 4000

WITHOUT ever having produced a really high-flying product, Abacus has proved to be one of the survivors of the industry with a mixture of original software and hardware. Its principal, Theo Sapountzis, has been an industry identity since the early days of microcomputers, having produced the "Famas" public accounting package which was a precursor of O'Reilly Software's successful system.

Abacus's relatively long involvement with hardware has been a mixture of assembling imported components and utilising boards of its own design. Its current main porcessor is its "Delta" board: Z80A processor, 64K-bytes RAM, direct memory access interface, two serial and one parallel ports, floppy disk controller for 8, 5.25 and 3.5in drives. It has an accompanying piggy-backed controller board for 5.25in, 5, 10 and 15M-byte Winchesters.

Most sales have been of the Century 800, a system with two 8in floppy drives, which was released in May last year. Running Abacus's own Business Basic, Century can be configured as a two-terminal, single-printer system to run any of Abacus's extensive range of business software. The Business Basic is being adapted to run under CP/M as well as in its original standalone mode.

A packaged Century system uses a dedicated Intel 8085 processor to control its screen and keyboard.

Abacus was the first company to bring a system using 3.5in drives into Australia, in May 1982, and has maintained its interest in those drives by including controller facilities on its Delta board. It is looking at Tandem as an alternate source of those drives for inclusion in its future products.

AED COMPUTER

AED Computer Pty Ltd
130 Military Road, Guildford, NSW, 2161
Telephone: (02) 681 4966
Systems: Universe Supercomputer II,
Supercomputer I, Pulsaed

ELECTRONIC instruments company Accoustic Electronic Devices took the standard entry into microcomputer manufacturing with the assembly of S100 and other bus boards. Its software innovation of Multiple Program Selection (MPS) has been a significant factor in AED's growth.

It recently established separate electronics manufacturing, research and development facilities at Merrylands, as well as sales outlets at Parramatta, Melbourne and Canberra.

MPS's psuedo concurrency preceded but has some resemblance to Digital Research's new high flier, Concurrent CP/M. MPS provides three keystroke switching between 10 concurrent CP/M tasks. It is being upgraded to provide the same switching between a mixture of CP/M and CP/M-86 tasks, as well as to go to 20 tasks for hard disk versions.

The advanced architecture of the Supercomputer II includes a dual processor card and provision to run other S-100 processor cards in available bus slots.

AED's own IEEE696 standard S100 mother board provides 16 data and 24 address lines, and is used by some other Australian S100 bus-based manufacturers. While some of the boards in early Supercomputer versions were imported, AED is expanding its range so that its products will be 100 per cent Australian at the board level by the end of this year.

As well as MPS, Supercomputer II provides a choice of several operating environments, including either CP/M or CP/M-86 running on its dual processor board, and Infosoft's Multi/OS.

Compared with typical personal computers, AED's business oriented range includes relatively high disk configurations and is well up market from ordinary personals. To fill a possible price gap below its range of offerings, AED continues to produce the economical Pulsaed based on Pulsar Electronic's Little Big Board.

Early this year, AED was seriously considering seeking equity participation to finance growth, but has been able to achieve its immediate objectives through improved cash flow without equity dilution.

AMUST

Amust Computer Corp (Aust) Pty Ltd
350 South Road, Moorabbin, Vic, 3189
Telephone: (03) 555 3644
System: Executive 816

LATE in August, Melbourne's Regent Hotel hosted the spectacular launch of the first Australian portable computer, Amust's Executive 816 "briefcase computer". The importance of the function and the product brought the federal Minister for Science and Technology, Barry Jones, to make the speech.

The origins of the Amust portable go back to Ron Harris and the Compak Computer Centre, where his tendency to innovate enhancements to some imported products which Compak was handling eventually led to Harris specifying a complete briefcase-sized portable. The hardware configuration is reasonably conventional with a Z80A processor, 64K-bytes RAM and two 5.25in floppy drives.

With the market for portable computers divided between the Aunty Jack (rip yer bloody arm off) transportables which might squeeze under an airline seat and the considerably smaller briefcase models which fit easily inside a conventional briefcase, Amust went for the middle ground with the Executive 816 built into a Samsonite briefcase.

The number "16" in the model number of the Executive 816 refers somewhat confusingly to the 1.6M-byte total capacity of its two inbuilt floppy drives.

Amust Computer Corp (Aust) Pty Ltd has been set up to combine the Compak's Australian design concept and software with Japanese money and technical assistance. The young Japanese company, Amust, supposedly took its name from former US president Jimmy Carter's drawled "I must..." with which he often began sentences.

Much was made at the launch of the Japanese involvement in the Executive 816 project, but when viewed against the commitment to manufacture 1000 units a month at Amust's Moorabbin, Vic, premises, the most important part of the Japanese contribution is undoubtedly dollars. The other benefits gained from the Japanese connection were mainly in procurement and some engineering detail.

Beyond the marketing capabilities generated by the high level of funding, Amust's success will depend heavily on the acceptance of its interesting and extensive range of bundled software. For many potential customers, Executive 816's range of software should prove more attractive than the traditional products available with other portables.

Highlight of the packaged software is the proven, locally developed IMS range of accounting packages for debtors, creditors, stock control and general ledger. Other software included with Executive 816 includes:

☐ Word processing with mailing.
☐ Database for simple application development.
☐ Communications with software-defined protocols.
☐ Project costing, cash flow projection and membership.
☐ Office time costing for accountants, etc.
☐ Games programs reportedly from Gobang & Co.

All that software, if it had to be bought individually across the counter, would cost more than Executive 816's under-$3000 tag.

Another important attraction of the software is the use of comprehensive menus to hide the interface to CP/M. An optional track ball, providing mouse-like input has been designed into the system and may be used as an alternative to cursor movement keys and single letter entry for user menu selection.

The communications facilities emphasise the machine's portability, with a switch-selectable choice of 240 or 110 volt AC power, as well as optional 12-volt operation. Its capabilities at home base can be extended via ports to external printers, 8in floppy or 10M-byte hard disk drives.

AUSTRALIS

Wide range of software in
* Accounting
* Wordprocessing
* Database Management
* Electronic Spreadsheet
* Telex Editor and Punch

Australian Designed and Manufactured Computer System
Single User and Multiprocessor Multiuser
2.4M-byte Flexible Discs to 40M-byte Hard Discs
CPM 2.2 Compatible Operating Systems

Manufactured by:

COMPROCESSING
COMPUTER SYSTEMS

P.O. Box 725,
SALE, Victoria 3850.
Phone: (051) 44 3399.

Distributed by:

MEDAIR PTY. LTD.
199 High Street,
BERWICK, Victoria 3806.
Phone: (03) 707 2386.

Enter K034 on Enquiry Card

APPLIED TECHNOLOGY

Applied Technology Pty Ltd
1 Pattison Avenue, Waitara, NSW 2077
Telephone: (02) 487 2711
Systems: Microbee 16, 32, 64

MICROBEE is the biggest success story of Australian computer design and manufacture, and the only Australian attempt to get into the demanding consumer market.

It has carved up the Australian schools market alongside Apple and the UK Government-funded BBC Acorn, and is listed on IDC's market predictions for this year as taking more than 10 per cent of the consumer market. Only Commodore is expected to sell significantly more units in Australia. Microbee has developed a dedicated hobbyist following reminiscent of the early days of Apple, and is in the process of expanding from Australian to international markets.

Applied Technology is a 10-year-old electronics company which typifies many early encounters with microchip technology. It developed chip-controlled burglar alarms before moving on to hobbyist kit computers sold through Electronics Australia in 1976. They were the forerunner of the Microbee, a product which has effectively taken over the company which created it.

While Microbee's successes are well known, few are aware of the precarious course it has sailed to make these achievements — growth, supply and contractural problems have had to be overcome at every turn. The problems would make an extraordinary book if any of the dynamos that keep the operation going could take the time off to write it.

The hardware design is owned by Applied Technology founder Owen Hill's private Micro World Trust, which also publishes a user newsletter Micro World News, which incidently, was the reason the magazine you are reading is called Australian Micro Computer Magazine. The Microworld Basic operating system of the Microbee 16 and 32 was developed by a good example of the much publicised "whiz kid" programmer, Matthew Star.

After Applied Technology's experience selling S100 bus systems and component kits, it decided to combine the key features in a single package, eliminating edge connectors and other multiboard overheads. In May, 1981, it was approached by the NSW Education Department and ultimately tendered Microbee that November. In the meantime the manual for a kit form Microbee was published as a 32-page magazine insert with service offered in the form of a $50 "no apologies" coupon.

The first 1000 Microbees were sold in kit form. Feedback from the hobbyist buyers was used to fine tune the commercial assembly process.

Hill looked for suitable injection moulding for the case and found it in Hong Kong. Then his chosen Japanese keyboard supplier required an order for 10,000 units, so the commitment to manufacturing that number of Microbees was born, and achieved in May this year.

The NSW schools contract was awarded to Microbee in April last year. It was an act of faith in the people involved as much as an endorsement of the product's technical worth. It was some months later before voices advocating support for an Australian hardware industry received any prominence, so the decision by the previously computer unaware NSW department was a real triumph for the company. A price for that triumph still had to be paid in the form of legal action from a distributor who claimed early rights to supply Microbees exclusively to schools.

The first deliveries to schools were made in the middle of 1982 and despite continuing problems delivering peripherals, Microbee was a household word in NSW within a year. Continuing media exposure was obtained through such events as the opening of its 2000-unit-per-month Gosford factory last May.

The complexities of international supply led Applied Technology to set up a purchasing facility in Hong Kong where the components that make up a Microbee are collected in plastic bags for distribution to assembly facilities like Gosford. International interest in the product, especially from the UK, has led to assembly facilities being set up in Hong Kong to service markets outside Australia.

Microbee's more recent success with the WA Education Department's requirement for a CP/M-based system has led to consideration of a second Australian assembly facility to keep up with the demand. Target assembly rates are one-unit-per-man hour, a figure which makes the country of assembly only a minor factor in pricing. While wave soldering is used for the piggy-backed memory boards, the main Microbee board has its components hand soldered in stages to facilitate modular testing.

The most attractive features of Microbee are its use of battery backed up CMOS memory which greatly reduces the inconvenience of using cassette tapes for program storage and the provision of the purchaser's choice of Basic, word processing and editor/assembler in ROM. When the Vic 20 arrived on the market, Applied Technology elected not to compete on price but to move slightly upmarket and improve the machines' features.

AUSDATA

Ausdata Pty Ltd
Unit 1, 175 Gibbes Street, Chatswood, NSW
2067 Telephone: (02) 406 5755
System: Ausdata 100

ORIGINALLY formed to provide optical character recognition equipment and custom interface products under the name Saztec Australia, Ausdata has maintained a relatively low profile in the Australian computer industry for almost 10 years. Among other things, Ausdata was appointed as the local agency for Motorola subsidiary Four-Phase Systems, supplier of distributed processing and office automation systems.

In 1982 Ausdata established a manufacturing facility in Chatswood for the production of microcomputer systems to be installed in retail delivery vans. Ausdata developed the so-called Portabil system for Amatil Ltd, which has supplied it initially to W.D. & H.O. Wills and APD Snack Foods.

Now Ausdata has launched its own general purpose system, the Ausdata 100, which places a heavy emphasis on communications and distributed data processing. The Ausdata 100 incorporates an integrated synchronous modem.

The single-board processor in the Ausdata 100 was designed for maximum adaptability for new applications and has already been committed for use in three new projects. Ausdata 100 can run Ausdata Entry general purpose data entry software, supporting a high-level format programming language with facilities for data entry and validation, key verification, batch management and communications.

Ausdata's general marketing philosophy targets the computer at large organisations which find they cannot achieve their personal computing goals with off-the-shelf products.

CMAD

Computer Manufacture and Design Pty Ltd
140 A'Beckett Street, Melbourne 3000
Telephone: (03) 329 8422
Systems: CM202, CM22, CM2

THE foundations of CMAD lay with a company involved in key-to-disk systems in the early 1970s. That group used an imported processor to which they added a combination of Australian-designed hardware and software. When the overseas processor manufacturer changed its product range, the Australian key-to-disk company was left high and dry, so it designed the CM202 16-bit minicomputer which was first demonstrated in September, 1975.

Early in 1976, the key-to-disk company merged with Australian Datronics. Consequently members of the key-to-disk development group left to form CMAD and bought their CM202 design back from the merged company. As CMAD couldn't continue in the key-to-disk market it had to make its Australian minicomputer work in its own right, and that meant developing a general-purpose hardware and software environment.

Unlike the overwhelming majority of Australian computer designs which depend on imported processor chips, CMAD's CM202 and later added CM22 are true general-purpose minicomputers locally designed from the instruction set upwards.

Also, unlike other local manufacturers, CMAD's equity was spread around a number of people with special skills to contribute from the start, although those people did not contribute significant capital. Until 1981, CMAD used all available finance for product development at the expense of market development.

The relatively recent design of the minicomputer architecture has provided opportunity for the inclusion of systems software facilities as part of the basic environment. On top of its multi-user, multi-programming operating system, CMADOS, CMAD has built a multi-user enhanced indexed sequential file system (Tree) with an ad hoc English-like inquiry language. Befitting its key-to-disk origins, CMAD developed its own high-volume data entry system.

Because it has a relatively upmarket product range, CMAD had to face users familiar with the brand names of imported products and give them real confidence that it would still be around to service their needs several years on. To overcome market resistance, CMAD developed its own Cobol-based integrated Business Control System (BCS) which operates in a general-purpose multi-user environment thus facilitating a turnkey approach to user needs with the inclusion of options such as its own word processor.

CMAD moved from a product development phase to serious marketing in 1981 with the sale of a 10 per cent share in the company for $200,000. It provides on-call software and hardware maintenance for all its products through offices in Melbourne, Canberra, Sydney and Perth.

With the maturity of its original product lines, CMAD has been working to extend both up and down market. It had designed a 32-bit bit-slice procesor but then looked at market needs and found greater potential below the lowest CM22 configuration down towards $20,000 systems. It recognised that the Motorola MC68000 microprocessor had addressed many of the same needs as had CMAD when designing its own 32-bit processor, so CMAD chose to depart from company tradition and develop the MC68000-based CM2.

CMAD has built its CM2 software on a Unix look-alike operating system, Regulus, which it has tuned to improve its commercial performance and provide compatibility by adding Tree and Cobol.

It is anticipated that CMAD will also expand upmarket with the introduction of a true 32-bit mini, possibly named CM2002, next year.

COMPROCESSING

Comprocessing Computer Systems
Cnr Cunningham and Desailly Sts, Sale,
Vic, 3850
Telephone: (051) 44 3399
Systems: Australis, Sprite

COMPROCESSING was set up in Sale, Victoria, by a group of people involved with the Bass Strait oil and gas fields. Building on Z80 processors and in one case the S100 bus, Comprocessing's two computers and other peripheral products emphasise networking.

Sprite is one of several Victorian shared-bus systems, with an individual slave processor for each user which shares resources through an S100 bus acting as an internal network. The Australis is a desktop unit with equivalent functionality to a Sprite terminal with slave processor, as well as supporting an extension of the networking capabilities of the Sprite system.

Comprocessing's networking uses its own networked operating system, MDOS, which presents a CP/M environment to each individual user. Locally developed software for the Australis and Sprite includes an extensive range of business and accounting applications.

Comprocessing's networking emphasis is illustrated by its linking of Casio cash registers to form a hotel point of sale system, and by its development of telex links which have won a contract with the Bureau of Meteorology to provide multiuser advanced weather forecast telexes.

As well as a large number of user sites throughout Gippsland, Comprocessing has been targeting the Melbourne market through its principal distributor, Medair of Berwick. The company has sold 16 Sprites to Joint Exchange Computers for use in the Melbourne Stock Exchange.

COMPSOFT

Compsoft Manufacturing Pty Ltd
233-235 Swan Street, Richmond, Vic, 3121
Telephone: (03) 428 5269
System: Rosi 65

COMPSOFT Microcomputer Services has been retailing micros for over three years, in that time getting involved in producing addon boards for Ataris and Apples. The step to manufacturing its own computer system was seen as a logical progression.

Compsoft obtained exclusive rights to a 6502-based processor designed by Rabble Ozi Computers Pty Ltd, a dedicated research and development company based in rural Shepparton, the commercial centre of Victoria's irrigation belt. The single-board computer provides: 80 by 24 screen format, RS232 and Centronics interfaces, 50K-bytes high-speed static RAM, up to 64K ROM space, four high-speed I/O ports, full ASCII keyboard with function keys and numeric pad, 6502 or 65C02 processor, Kansas City format cassette interface, and floppy disk controller for up to four, 8 or 5.25in drives.

A key target market for Rosi 65 is in schools, where it hopes to offer a version for under $A1000 including disk as soon as economical volumes are achieved.

While low resolution graphics (256 by 192 pixels) is already available on an addon board, Compsoft is working on a very high resolution (1000 by 1000) color graphics system for both the Rosi 65 and a future MC68000-based system. In keeping with Compsoft's addon development for other computers, an extensive range of specialised boards is being developed.

Compsoft's future design emphasis is expected to be on networking and multitasking.

COMPUTER AND INDUSTRIAL ELECTRONICS

Computer and Industrial Electronics (Australia)
256 St George's Terrace, Perth, 6000
Telephone: (09) 322 1045
System: ET88

WIGTON Pty Ltd has set up two businesses, Computer and Industrial Electronics and Electronic Technology (Australia).

The group went into a Z80, 64K, twin floppy system which it found to be a good business computer. After waiting a long time for Winchester disks to reach the reliability level it wanted the group went ahead with its new desktop 8088 based model, ET88.

While prototype ET88s are in use, volume production has been held up waiting for volume deliveries of Hitachi's twin slim profile 8in floppy drives. Meanwhile, the group is concentrating on manufacturig its M100, an ergonomic VT100 emulating terminal.

One particularly interesting aspect of the ET88 design is its utilisation of Intel's 8089 co-processor which simplifies data transfer and controls I/O, providing increased throughput.

The Wigton group works closely with an associated software house, Index Computers. They have just rewritten their own Business Programming Language (BPL) which is portable at object level, being written in itself (similarly to Pascal Pcode).

For hardware development, the group does only preproduction and small batch assembly inhouse, contracting out volume work to local subcontractors. It has a multiuser networked system in development.

DATAMAX

Datamax Pty Ltd
34-40 Central Avenue, Manly, NSW 2095
Telephone: (02) 977 6522
Systems: 8000 FD, 8000 HD, 8000 MHD

ALTHOUGH a reasonably small firm, CP/M manufacturer Datamax gives a strong impression of reliability and stability. Datamax was founded by an Australian-educated Chinese, Chin Kwong, after he saw an opening for the export of computers to China during a visit there.

On returning to Australia, Kwong commenced design on the current Datamax computer, a well-packaged CP/M machine based on Datamax's proprietary single-board system, which includes space for all available options on the board.

The Datamax range now contains floppy and hard disk, single and multi-user configurations; and such optional extras as a battery-backed-up clock, IEEE488 interface and floating point co-processor. While compatible with most terminals and printers, Datamax is now relabelling ICL terminals and ICL's OKI printers for supply with its computer.

As well as several important clients in China, Datamax also exports to Hong Kong and New Zealand. Its most important local customers are universities, especially Macquarie and NSW, both of which have 60 units installed. Other local sales are made through OEMs.

DEDICATED

Dedicated Micro Systems Pty Ltd
173 Cantebury Road, Canterbury, Vic, 3126
Telephone: (03) 836 9270
Systems: DMS 4100, DMS 4105

DEDICATED Micro Systems (DMS) has opted for a high-performance 8-bit system as its entry into computer manufacturing. The company's activity as a NEC dealer has caused the NEC APC and other products to influence design considerations for the DMS computers.

The DMS range is based arond its own large single-board computer which has a heavy emphasis on interface capabilities as well as processing performance. The board can be configured with a choice of a 6MHz Z80B or an 8MHz Z80H running full speed without wait states, using 150 or 120 nsec RAM respectively.

The 128K-bytes RAM on board can be bank switched between a user and a system area, the latter containing an extensive Bios (resembling that of CP/M plus), screen memory and space for disk cache. Alternatively, it can be configured as an economical multiuser system, especially for control system applications where there is typically one person running the system, with event monitoring taking place in background.

As well as the choice of single or dual floppy drive configurations, the system can be enhanced by the choice of DMS's own (non-graphic) color terminal and 10 to 30M-byte Winchester disk subsystems, the latter starting at $A3500. DMS is developing a 1M-byte RAM card for use either in extra bank switching or as an M drive for high-speed disk-based applications.

The DMS systems are not targeted at the introductory level, but as an addin system for established computer users with high performance requirements.

DEWHIRST

The Dewhirst Corporation Pty Ltd
428 St Kilda Road, Melbourne 3004
Telephone: (03) 267 5877
System: Data Base Machine (DBM)

DEWHIRST developed its business on two fronts: sophisticated database systems for microcomputers, and retailing the IMS shared-bus system.

The Dewhirst DBM, uniquely optimised for heavy database processing applications, has been developed board by board during 1983 with some boards from other manufacturers being used to provide demonstration systems showing some of the advantages of the early Dewhirst boards. The complete DBM is to be shown for the first time at 10ACC, with the units on display already presold.

DBM is positioned in the market to compete directly against conventional time-shared minicomputers, providing effective multiuser access to shared databases with the virtual elimination of degradation due to contention and at a considerably lower price.

The design breakthrough to provide the total sysem performance as the use of direct memory access (DMA) circuitry on all boards, providing data transfer between users' individual slave processors and the shared system resources more than 20 times faster than on comparable systems relying on microprocessors' programmed I/O.

The central processor (CPU) which arbitrates shared resources has many functions removed from its responsibilities to other dedicated cards, such as the system support card and a slave card optionally dedicated to MDBS III database management routines. However, the CPU is further enhanced by the use of l4K-bytes of dual set associative cache and memory management circuitry to address up to 1M-byte of memory.

IMS also includes Dewhirst's own DMA floppy and SMD hard disk controllers. An indication of DBM's projected volumes is given by Dewhirst's becoming one of Control Data Australia's two biggest OEM customers for its Lark 50M-byte disk drive.

DULMONT

Dulmont Electronic Systems Pty Ltd
148 George Street, Hornsby, NSW, 2077
Telephone: (02) 477 6444
Systems: Magnum 256

THE Australian personal computer which has done most to capture the imagination of the industry is a powerful package squeezed into what some would call a "notebook sized" package, a "true portable". Apart from a world standard design specification, assuming delivery on schedule, the big thing Dulmont's Magnum has going for it is the support of Tom Cooper's President Computers retail distribution chain.

Dulmont is a joint venture company formed by Australian multinational electronic distribution equipment supplier Dulmison, which held the initial rights to the Magnum design.

Early this year Tom Cooper waved a picture and specification of the Magnum at a goggle-eyed dealer meeting. He has been reportedly stockpiling advance order cheques ever since.

The only way words can convey a picture of Magnum is by listing its features:

☐ A 12in by 11in by 2in package weighing less than 4kg and including a full-size qwerty keyboard and an 8-line by 80-character liquid crystal display. Samples of a 16-line version of the pixel addressable display are reportedly being tested.

☐ Up to 40 hours' battery operation between recharges and 256K-bytes of battery-backed-up CMOS RAM.

☐ ROM resident MS-DOS, Basic interpreter, spreadsheet and word processor, with plug-in ROM personality modules to provide other applications.

☐ An Intel 80186 processor which is switched off to conserve power when not in use, such as between operator key strokes.

☐ Expansion cabinets to cable-connect two slimline disk drives in a package of similar size to the Magnum and to provide an IBM PC-compatible expansion bus.

Magnum was scheduled for official release at 10ACC with production starting in September and reaching 400 units per month from October. The most surprising thing of all is the retail price of just under $2500 including bundled software, which will do a lot to perpetuate the false impression that little portable computers can sensibly be cheaper than larger personal systems.

ERACOM

Eracom Pty Ltd
6/26 Greg Chappell Drive,
Burleigh Gardens Industrial Estate,
Burleigh Heads, Qld 2440
Telephone: (075) 56 0911
Systems: ERA-60, ERA-80

HAVING worked in mainframe environments, including extensive work overseas, Dr Bill Caelli left Control Data to form Electronic Research Australia Pty Ltd in mid-1979. Caelli's long established interest in data security issues determined integral data security as an important objective for his company's systems.

ERA started up in Canberra designing and prototyping the ERA-50, an 8-bit CP/M, MP/M, and, UCSD-Pascal system with up to 512K-byte of bank-switched memory. It had to contend with the lack of an industry infrastructure by doing its own cabinet metalwork and even getting its first few models covered in vinyl by an automotive upholsterer because it could not source the required quality of enamelling.

A grant from the Australian Industrial Research and Development Incentives Board was the major source of funding for ERA's original development program.

To achieve the desired multi-user operation of ERA-50, ERA had to extensively rewrite MP/M version 1 to make that operating system work at all. In doing so, it produced its own extended input/output system (XIOS) which became virtually an operating system in its own right. Caelli's colorful picture of XIOS was as a cottonwool cocoon protecting the fragile MP/M.

Lack of venture finance proved a problem in the development of ERA, with private investors keeping it struggling along in Canberra until the middle of 1981. Discussions were held with the Canberra Development Board and the state governments of NSW, Victoria and Queensland for assistance in finding the capital required to move out of the prototype phase and into serious marketing and production.

The entry of Bruce Small, son of the Gold Coast developer, the late Sir Bruce, provided sufficient assurance for the Queensland government to provide a $1.3 million loan guarantee.

ERA departed Canberra for the Gold Coast and further developed its range, producing ERA-60, an enhanced version of ERA-50 including the long-planned encryption security facilities.

Beyond the 8-bit world, ERA has developed a high-performance system based on Intel's 8086, 8087 and 8089 chip series. It has also developed a data-line encryptor, the ERA-2007, as an important standalone product utilising ERA's security technology using an 80186 processor, ROM-based software and 128K-bytes RAM all used as a network node.

ERA has always aimed to develop products for the world market with its commitment to IEEE796 standard Multibus boards.

Eracom's objective is to increase its claimed lead in secure systems, including the incorporation of public key encryption techniques in both computers and dataline encryptors.

Eracom is looking at the emerging range of 32-bit processors, but is keeping its options open with its capability to return to high performance bit slice architecture, including use of the increasingly diverse range of special function chips now coming on the market.

GENERAL ELECTRIC DEVELOPMENTS

General Electric Developments (Sales)
Pty Ltd
396 Victoria Road, Gladesville, NSW, 2111
Telephone: (02) 816 2211
Systems: CentiNet, System 85

ANALOGUE systems expert Rick Walters set up General Electronic Developments (GED) to manufacture specialised systems for hospitals and government departments. It gained an important break when EMI dropped out of that field and licensed its business to GED. By redesigning and adding to that range, GED has built up a comprehensive range of analogue systems.

The company moved into digital systems with the recruitment of David Hatch from AWA to design a high speed data terminal. GED also released a single board CP/M system in the same year, one of the first to reach the market.

Walters says the company's growth has been slower than some others in the industry because, as an analogue engineer, new digital concepts had to be justified to him at a more detailed level than if he was fully conversant with digital terminology. His background also enabled him to look objectively at market needs, and has prompted GED's move into networking.

Meanwhile, data processing products have passed 55 per cent of GED's business and are expected to grow to 75 per cent. But this has not stopped development in its preferred analogue area of precision timing equipment, where it recently patented a chip-driven wall clock. Any potential profits GED might look like making are ploughed back into research and development by hiring extra staff.

Walters' view of the need for economical networking led to the recent development of a Z-80 based 64K-byte RAM desktop computer, which can be linked to form a Centinet network.

An identical system is provided for both workstations and the central data management computer, except that the workstations have one optional 8in floppy drive while the central system has two drives out of the eight which can be linked to any unit's floppy controller. The network connection is claimed to contribute less than $A50 to the end user cost for each workstation.

As well as a built-in floppy drive each unit has an interesting selector channel, reminiscent of mainframe architecture, which can connect up to 32 complex peripherals including large Winchester disks and ½in magnetic tape.

Dewhirst

Announcement to OEMs

The Dewhirst Data Base Machine will be released at 10ACC. Multi-user prototyes are now available for inspection and benchmarking. The DBM is specifically designed for extremely rapid data I/O. Australian designed and built, the entire system uses DMA for all data transfer. Industry standards are complied with totally, e.g., Centronics 101, IEEE 696, 8" CP/M format diskettes, SMD interface, Ethernet interface. Runs all CP/M software including MDBS III, RM COBOL and CIS COBOL.

*** 2 year warranty ***

(See us at 10ACC — Stand 74)

The Dewhirst Corporation Pty Ltd
428 St Kilda Road, Melbourne, Vic 3004
Tel: (03) 267 5877 Telex: AA36629 "EXTEL"

Enter K074 on Enquiry Card

HARTLEY

David Hartley Computer Australia
80 Jephson Street, Toowong, Qld 4066
Telephone: (07) 377 0509
Systems: 3900 Series

THE story of the rise and rise of Hartley is the most widely recognised episode of the Australian computer industry. The impact of that publicity on outsiders views of the potential viability of an Australian manufacturing industry cannot be over-emphasised.

Hartley's packages for chartered accountants, running on a variety of US small business systems, were the most successful software products to come out of Australia. Hartley's decision that buying from such suppliers was not the best way to run a business may have been the most influential decision ever made regarding computer manufacturing in Australia.

While there is no doubt that the 3900 series of computers designed by Hartley provide the best environment in which to run the company's excellent software, the changes necessary to the company appear to have been underestimated by Hartley.

Designing, developing, enhancing, supporting and marketing software products to a well-defined target market are all operations with a limited appetite for capital, being funded by many hundreds of small Australian software houses quite simply out of revenues earned. The occasional failure in such companies cost few, apart from the founders, any real money, with somebody always willing to take on the maintenance of software at the right price.

Hardware manufacture demands totally different financial gearing. Trying to fund it on the same hand-to-mouth basis that is possible with applications software development is fraught with danger. In Hartley's case it was the limited financial backing extracted from the Queensland government which laid the foundation for crisis, the government foreclosing when a capital repayment was late and pushing the operation into insolvency with substantial losses to both the government and private backers.

The re-establishment of Hartley as a manufacturer and a software house with the backing of a New Zealand insurance company illustrates that the basic business concept was viable all along. Certainly some fat was trimmed and some substantial development costs written off as investors' losses, but the subsequent return to solid profitability means that the whole operation could have been kept afloat with better-informed management and more realistic financing.

While it may appear that one of the big lessons of Hartley's collapse was the ineptness of government financial backing, there is no doubt other governments which are becoming increasingly active in that area have taken good note and adjusted their modus operandi accordingly.

Hartley's software-user base of well over 1000 systems in a vertical market is such a goldmine that it is no surprise that former Hartley staffers have set up in opposition with similar packages running on hardware that Hartley had discarded when it went ahead with its own manufacturing.

Hartley's 3900 Series computers cover an extensive range of configurations from an entry level twin floppy version to a large 256M-byte hard disk system to cater for major chartered accounting companies. The dedicated accounting software has been regenerated under Hartley's own proprietary operating system, H86, with the 3900 Series' use of the 8086 processor enabling MS-DOS to also be offered.

The architecture of the 3900 Series is considerably more sophisticated than most personal computer implementations using the 8086 processor. Hartley's computer was one of the first 8086 systems to go into production anywhere and has been pushed closer to small minicomputer performance by features such as a separate processor and local memory for each screen and keyboard.

In fact, the development of 3900 architecture, optimised for Hartley's software, has given the company's software a performance edge compared to competitive systems running on general-purpose imported hardware, even though the imported hardware may appear to be a more powerful general-purpose computer.

NOW AVAILABLE

BAR CODE READER SHARP PC 1500
& General Purpose Interfacer

Minit
COMPUTER
SERVICE

119 McCRAE ST, BENDIGO, VIC. 3550.
(PREMIER TOWN)
PHONE (054) 43 2589.

$350 including UPC, EAN software
$199 including manual PLUS TAX IF APPLICABLE.

Our general-purpose interface can be configured for a variety of Input/Output requirements. Many applications would suit such as data logging, switching, controlling, where a battery-powered device is required.

Don't hesitate to contact us on a special requirement.

Enter K028 on Enquiry Card

LABTAM

Labtam International Pty Ltd
43 Malcolm Road, Braeside, Vic, 3195
Telephone: (03) 587 1444
Systems: 3006, MU3000

LABTAM *now* is a high-performance desktop computer and a floor-mounted multiuser system which could be considered to offer more appropriate utilisation of the advanced facilities available. Labtam *then* was a successful manufacturer and exporter of scientific instruments, especially emission spectrometers for which it had developed an earlier dedicated computer of its own design.

As the current Labtam computer is reviewed elsewhere in this edition, it is sufficient here to look at the features which place it up-market in performance but not price from the enhanced IBM PC compatibles.

Labtam has for the time being stuck with the Digital Research CP/M family of operating systems but has adapted them quite heavily to produce new performance standards. For example, to run ordinary 8-bit CP/M code, an object program is executed by the onboard Z80A, but system calls are intercepted by an emulator program which signals the faster 8086 processor to carry out the functions required.

As well as faster execution than is possible in a standard CP/M environment, the partial emulation procedure has the added advantage of leaving a particularly large transient program area of around 62K-bytes available for application programs.

Two major innovations provide disk performance that is both faster and more useful than on comparable systems, and disk access is the limiting factor for a substantial portion of computer applications. Massive speed improvements are provided by the use of multiple (currently six) track buffering in the disk controller's cache memory which eliminates a substantial portion of disk seeks and head selections. Operational flexibility is provided by software to read standard 8in and most 5.25in diskette formats.

Labtam's success with scientific instruments is based on atomic emission spectrophotometry for analysing elements, particularly using inductively coupled plasma, which it claims to be the only company to have fully developed. Labtam International is the third company in the group, which started with R&D Instruments Pty Ltd and Labtest Equipment Co (SE Asia) Pty Ltd.

Labtest won a federal Department of Trade "Export Award" for outstanding export achievement in 1982. Its significant international customers include Malaysian defence, Korean and Singaporian institutes of standards, China steel and USSR iron and steel.

The group claims to have been one of the first businesses in the world to utilise a microprocessor (the Intel 8080) with a bus and operating system called Labdos and a scientific Basic it called Labtam.

The Labtam computer's visibility has been considerably boosted by a competition to give one away.

The companies are wholly owned by founding and still active directors Don Dryden and Heimo Eberhardt.

L & L AUSTRALIA

L & L Australia Pty Ltd
Cnr Canterbury and Liverpool Roads,
Kilsyth, Vic. 3137.
Telephone: (03) 728 1888
System: Unison

UNISON is a MC68000-based computer designed during 1981 by Bill Hollier of Information Mechanics Incorporated Pty Ltd (IMI). Early attempts by IMI and its associates to obtain government and corporate backing for Unison came to nothing, so it went ahead alone and developed prototype boards, the first of which were publicly shown in August, 1982 at a Melbourne Unix users' group meeting.

L & L Australia Pty Ltd was the marriage of a local company successfully selling computerised petrol pump tops and other fuel-distribution industry systems on the world market and Kelvinator Australia, a subsidiary of the publicly listed Email white goods manufacturing group. L & L had been using the first widely available Unix-based multiuser micro, the Onyx, to develop more sophisticated backroom fuel distribution control systems.

After protracted negotiations, L & L purchased Australian manufacturing rights to Unison as a replacement for Onyx and to expand into the general-purpose computer market.

Great positive expectations for Unison were built up in the latter part of last year, as L & L moved into modern premises with substantial production capacity and accepted a $700,000 loan from the Victorian government to boost the Unison project.

However, L & L's entrepeneurial founder, Corrie de Waard, suffered a serious illness, retired and subsequently sold out his interest to Kelvinator during the first half of this year — a period during which the Unison project seemed to be drifting aimlessly.

CSIRO offshoot Siromath Pty Ltd was charged with porting its version of Unix, called Sironix, to Unison. The several hardware and software developments necessary to get Unison into full production were variously seen as delaying factors, but some new stability seemed to be taking hold of the project by the middle of the year, with nothing likely to stand in the way of a launch before or at 10ACC.

Although Unison's design matches the best of the 68000 systems on the market, a couple of bugs noticed by users of pre-release machines will certainly mean that the finally released version will be carefully evaluated before gaining the level of acceptance that has long been anticipated.

MACPRO

Macpro Computer (Aust.) Pty Ltd
183 Bank St, South Melbourne, Vic 3205
Telephone: (03) 699 3100
Systems: System 250, Network 1250,
MBS-80.

MACPRO arrived unheralded in April with virtually a second-generation Australian machine — one that was assembled from locally manufactured components, together with a flair for attractive packaging. Macpro's brand-new retail premises and equally new small business computers were launched by Victoria's Minister for Economic Development, Ian Cathie, after the company had escaped the climate of rumour and expectation that surrounds the birth of most new computer companies.

The initial Macpro units were based on Pulsar's Little Big Board processor in a choice of either single processor or multiple slave processor systems. The use of Pulsar's 256K-byte RAM card provided a choice of either single processor MP/M or multiple processor TurboDOS as multiuser operating systems.

The first impression of the Macpro is its strikingly clean lines and black-and-white color scheme which would not look out of place in the plushest office. It is offered with matching furniture whch includes a shelf for the processor unit, with its two 8in drives below the desktop. Even the terminals and printers offered with Macpro are design and color co-ordinated.

The availability of the proven IMS range of commercial software completes the lineup of local components which have been integrated into Macpro.

In August Macpro launched its second-generation of machines, "Mini Business Systems", which are single processor desk-top units featuring the new 5.25in high-density floppies which imitate 8in drives, but which otherwise resemble the original products.

MF COMPUTERS

MF Computers Pty Ltd
9 Ada Avenue, Brookvale, NSW 2100
Telephone: (02) 939 1800
Systems: MF2000, MF4000

THE story of Mr Floppy is of one of an early worker in the industry deciding to do his own thing. Peter McNally worked with John F Rose in the earlier days of S100 bus cards coming into the country, work that was mainly assembly and disk drive repairs.

He set himself up as a drive repair specialist and so brought the "Mr Floppy" name to prominence with an increasing number of customers, especially universities and similar large organisations. Although much of that continuing service work is now brought in to his Brookvale factory, Mr Floppy still makes field calls to repair six or more drives at the one time.

This year he has attracted an increasing number of hard disks for maintenance, and while he had been able to fix 90 per cent without needing to open the chambers, he is now setting up his own clean room so the whole job can be done at the one location.

Mr Floppy's first step into manufacturing was with addon 8in floppy drives with almost 70 in the field, mainly in development systems and for which clients had to obtain their own controllers. With decreasing component counts it became possible to package two slimline drives with a single-board computer to produce the economical MF2000 box.

The circuit design and systems software for the computers were done in collaboration with other independent Sydney operators. Board soldering has been sub-contracted but Mr Floppy is looking at flow soldering inhouse.

The MF4000 is a hard disk version incorporating a 19M-byte drive formatted as two 7.5M-byte logical drives. Mr Floppy has also done a controller for ACT's 10M-byte fixed/removable drives.

Expected future directions for the company include its own 80286 processor, with an 80186 board possibly imported as an interim measure. M F Computers has always built on spec rather than to order, with service still being the backbone of the company and its cash flow.

PULSAR
ELECTRONICS PTY. LTD.

MICROCOMPUTER BOARD
fully STD bus compatible

While the 6000 series is fully compatible with the industry standard STD bus, attention has been given to partitioning the circuit so that a complete disk based computer system can be constructed using a single card. Included onboard are a Z80A processor operating at 4MHz, 64Kbytes of DRAM, single/double density floppy disk controller for up to 4 drives, two full duplex RS232C channels with software selectable bit rates of 50 to 19200bit/s, 2Kbytes PROM bootstrap/monitor and battery-backed real time clock and calender. Implementations of CP/M, MP/M-II, CP/Net, TurboDOS and Multi/OS operating systems are available.

PULSAR ELECTRONICS PTY LTD
Lot 2 Melrose Drive,
Tullamarine, Victoria 3043.
Telephone: (03) 330 2555.

Enter K073 on Enquiry Card

MICA

Mica Associates Pty Ltd
Cnr Gladstone and Townsville Sts, Fyshwick,
ACT, 2609
Telephone: (062) 80 4509
Systems: V252 Integrated Workstation, V231
Cluster Controller and V212 Workstation

MICA was formed in late 1980 by a group in Canberra, some coming from Information Electronics's hardware and software terminal development team. The new company spent its first 12 months involved in bread and butter contract consultancy, but that has been phased out with increasing emphasis on its V200 range.

Mica's strength is in IBM 3270 series terminal emulation and enhancement, especially the provision of local processing capabilities to enable workstations to double as personal computers. Its initial sales have been particularly strong in 3279 color terminal emulation, using CRTs specially developed by Hitachi with a sky-blue phosphor to match IBM's, rather than the conventional spectral blue.

Its initial range of integrated workstations include 8in double-sided double-density IBM extension format floppies and optional 5.25in Winchesters.

Mica's software development is tied to Digital Research's systems products, with CP/M-86 and CP/M-80 both available at the integrated workstations and PL/M-86 used for software development. It is a beta-test site for CP/Net-86 which will be provided on its clustered workstations due to go into volume production before the end of the year.

Mica received assistance from the Canberra Development Board in setting up its operation in the ACT as well as normal federal research and development grants. It uses other Australian companies as sources of materials, including sub-assemblies from Rifa in Melbourne and case molding by a Sydney company.

Mica sells by direct tender to government, OEM orders from three major minicomputer and mainframe suppliers, and has arranged a new Sydney distributor. It now subcontracts any applications software necessary but is still prepared to take on special development work to help sell its products.

Beyond its local network and processing capability, a big attraction of Mica's cluster architecture is its ability to message switch between multiple host systems.

ORTEX

Ortex Australia Pty Ltd
Unit 3/1 Pirie St, Fyshwick, ACT 2609
Telephone: (062) 80 5283
Systems: Pascal System 1, Ada System 1,
Net 186, Micro mainframe

OF all the Australian manufacturers, Canberra-based Ortex makes the greatest effort to run at the front edge of technology. It started by using the first dedicated high level language microprocessor, the Pascal Microengine, with which it moved to the proclaimed language of the future, Ada. Without waiting there, Ortex is using its own computer-aided design (CAD) system to develop powerful networked systems based on the latest generations of Intel chips.

Ortex's CAD system uses pin specification data for each chip package to validate a board design, which is then converted to the specifications required for multiwire assembly of the specified board.

The first of Ortex's Intel-based systems is called Net 186 because it contains a 80186 processor and an Intel 80586 Ethernet interface chip for networking.

One of the first applications for a Net 186 is upgrading the Ortex CAD system to improve its performance for designing future systems.

The current project, with anticipated October release, potentially make all other announced Australian systems pale into insignificance. Ortex's so-called micro mainframe features an 80286 with 1M-byte of RAM and an optional 80287 math co-processor, one or two 80186s each controlling eight terminals, an 8089 high speed I/O processor which does byte and word direct memory access transparently and string comparisons on the fly, 80586 Ethernet interface and 15 expansion slots, each of which can contain a "slave" card with a further 80286 and up to 16 more users.

Ortex maintains contact with CSIRO offshoot systems house Siromath, which has a Unix source licence, and with the Defence Department, which has a vital interest in Ada and is a potential source of a database system for Ortex. The Micro mainframe is believed to be under consideration by Intel as a host environment for the development of Ada for the 432 Ada optimised chip set, currently done on Vaxs.

PERICOMP

Pericomp Computer
13th Floor, ADC House, 99 Elizabeth St,
Sydney 2000.
Telephone:(02) 233 3266
System: Pied Piper

PERICOMP was started some three years ago as a peripheral sales company. Research and development into peripheral add-ons and microcomputers suggested that market opportunities existed for a low-cost multi-user micro with large storage capacity options. The outcome was Pied Piper.

The system was launched in Brisbane last April and in Sydney in May. By late July it had 24 installations and was targeting around 200 by next June. Pericomp attributes Pied Piper's immediate success to its low-cost use of CP/M and MP/M, plus the sound backing of Australian Development Corporation Ltd.

Pied Piper is based on a single board designed by Brisbane engineering company Mini Micro Scientific. The board contains all the basic features and options of the six versions of Pied Piper, from 64K-byte RAM and two 380K floppy disks to 256K RAM and a 20M-byte hard disk. Several communications ports provide a variety of interfacing, most notably three Multibus slots which could potentially accommodate any of the variety of available Multibus boards.

Pericomp has added Sydney manufacturing and warehousing to its original Brisbane base, as well as retailing its systems in both cities, and using agents in other major cities. Its future plans include 8086 processors which are being prototyped followed by 68000 with Unix. It plans to upgrade the processors while keeping the same peripherals.

PRECISION

Precision Micro Systems Pty Ltd
3A/18 Milford Street, East Victorian Park,
WA 6101
Telephone: (09) 362 4885
Systems: Co.Worker Series 808 and 808/HD

DECISIONS made in the relative isolation of south-eastern Australia can be even more easily made in the greater isolation of Perth, so it is hardly surprising that one of that city's small band of hardware manufacturers has elected to go with the IEEE696 standard S100 bus as a design environment. Precision Micro Systems has found itself so busy manufacturing such systems, as well as doing research and development for other people, that it spun off a separate organisation called Co.Worker to do its retailing.

Precision was founded with the aim of doing software development, but it did not consider any of the then available hardware to be suitable, so changed direction and started building its own. It also claims a substantial price advantage against leading imported S100 bus suppliers, together with the advantage of being able to support its product better locally

Precision's hard disk models from 20 to 70M-byte have recently had streamer tape backup added to their offered configurations. Other recent enhancements include: an 8086 processor card, multiple slave processors running under TurboDos, and a 64K-byte printer buffer which is particularly useful in multiuser environments.

PROGENI

Progeni Systems Ltd
9 Alexander Street, Mt Waverley, Vic, 3149
Telephone: (03) 277 2699
Systems: Poly-1, Proteus

AS well as the 30 Australian manufacturers listed in this supplement, it is appropriate to include the only New Zealand manufacturer with any visibility in the Australian market. Progeni, through its takeover of the original Poly hardware designer, Polycorp, has put together a product and story which is different from those of the 30 Australians, but contains important lessons.

Progeni is an important NZ software house with offices in Melbourne, Sydney, and Los Angeles. One of its most important software products has been Progeni Tools, a set of development aids bridging the gap from third to fourth generation languages which have been installed at around 10 per cent of Burroughs mainframe sites worldwide. Software developed for the Poly micro has been based in part upon the software technology used in Progeni Tools.

Polycorp's Poly-1 design is uniquely recognisable with its angled extensions protruding from each side. The real purpose may only be obvious to people familiar with Poly's targeted classroom environment — they are rugged carrying handles built as one piece into Poly's moulded case and they are intended to improve the balance of a person carrying the Poly.

As with some other products targeted at the education market, Poly has a couple of limitations which are jumped on by theorists, but which have not prevented it getting the NZ government support necessary to ensure useful production volumes. The use of the 6809 processor, a poor third to Z80 and 6502 in the race for 8-bit volumes, has severely restricted the range of independent software available to run on Poly. The Polygen software development tools have helped counter that limitation in Poly's target market, the classroom, while facilitating the development of the range of courseware on which that market depends.

As well as providing shared access to disk resources for a network of Poly terminals, the Proteus disk server includes dual processors to handle 6809 programs for the workstations, as well as Z80 programs for administrative processing.

PULSAR

Pulsar Electronics Pty Ltd
Lot 2, Melrose Drive,
Tullamarine, Vic, 3043
Telephone: (03) 330 2555
Systems: 6005T, 6005HT

PULSAR is a very successful circuit board design and manufacturing company whose products have recently grown back to full microcomputer systems. Its Little Big Board STD bus single-board computer and 256K-byte RAM card are incorporated in the products of more than one of the other Australian manufacturers listed in this supplement.

Little Big Board contains: Z80A processor, 64K bytes dynamic RAM, 8in floppy disk controller, two serial ports and a battery-backed clock/calendar. The key to Pulsar's going from single-board systems to a complete packaged unit has been the availability of high-density 5.25in disk drives and media which are formatted as industry standard 8in floppies.

Pulsar has continued in special circuit board work for volume customers both in Australia and overseas. It claims to have the design process so finely tuned that it can commence production 90 days from receipt of an order for a board of the complexity of Little Big Board.

For both its single board and packaged systems, Pulsar has implemented and developed an extensive range of systems software, including CP/M, MP/M II, CP/Net, TurboDos, Multi/OS and a suite of hardware specific utilities.

Pulsar's STD bus boards are open products, with complete circuit designs and other technical information freely supplied with the boards.

RDM COMPUTERS

RDM Computers
225 High St, Northcote, Vic, 3070
Telephone: (03) 481 0136
Systems: RDM-1, RDM-2, RDM-3, RDM-4

RDM Computers is the present organisation of a group which has been dabbling in the application of single board computers since such devices first appeared on the scene. The company is their first real attempt to produce a product line with potential for volume sales.

That product line is built around RDM's Aussie Byte single board computer, a board which boasts more features than possibly any other similarly priced offering: Z80A processor, 256K-bytes RAM for up to four simultaneous users, 32K-bytes pixel addressable graphics memory, video display driver and 8-bit keyboard input plus four bidirectional serial ports and a centronics parallel port, DMA floppy disk controller supporting 8 and 5.25in drives simultaneously, DMA interface to Winchester controller, battery backed up clock/calendar, optional onboard speech synthesiser, light pen input, system expansion connector to interface to various bus implementations.

Not surprisingly, many potential customers' first reaction to Aussie Byte was to ask for it to be packaged with keyboard, screen and disk drives to enable it to be put to real use. So RDM responded by packaging the board with various combinations of floppy and hard disks, thus building up range of systems.

Aussie Byte and the RDM desktop units are designed to support the latest range of CP/M based operating systems: CP/M 3.0, MP/M II, CP/Net and Turbodos. Memory management circuitry and fully vectored interrupts, including real time clock, facilitate those environments. Pricing is particularly competitive with a 10M-byte hard disk, four-user system starting at less than $US8000, which includes the first screen.

SME SYSTEMS

SME Systems Pty Ltd
22 Queen Street, Mitcham, Vic, 3132
Telephone: (03) 874 3666
Systems: Titan TMC-150 and -200, Unicorn MPU-150 and -200

SME Systems is a specialist S-100 bus board design company, manufacturing nearly 20 different S-100 cards. It has been providing multiprocessor systems for specialist applications for 18 months, including 200 units to the NSW government for the grain industry.

The recent low key release of its MPU series is the first time its systems have been released on the general market. Slave cards provide simultaneous operation of Z80, 8086 and 80186 processors. It claims to be able to run CP/M in different slaves simultaneously.

As with several other S-100 based systems, specialist cards enable such facilities as extended I/O, analog to digital conversion and color graphics to be added to the network. The unusual feature of SME systems is that the boards providing such special features are quite likely to be its own, as it produces an extensive range of such boards which are also sold separately.

SME was originally formed as a manufacturer of hobbyist electronic products and do-it-yourself kits. Its principal, Mike Pratt, became well known as a source of technical advice.

When the demand for economical desktop systems overtook the early bus-filled boxes as the dominant application of microprocessor technology, SME like other Australian and overseas S100 companies transferred the knowhow it had developed through a design process of bus elimination to produce neat desktop units.

SYSTEM ONE

System One Pty Ltd
14/447 Kent Street
Sydney 2000
Telephone: (02) 267 2388
Systems: Model 500, Model 550, Model 800

QUITE a few of the Australian hardware manufacturers sell on the strength of their own proprietary software, particularly accounting software, but none more so than System One. It has really stretched the power of a single Z80 processor to serve five concurrent users running its own applications packages, with the option of rebooting single user C P/M for access to other commercial software.

System One's operating system arose mainly by historical accident, the pioneers of the company having started in the first days of home-built microprocessors, back when memory was expensive. They developed a 2K-byte operating system which, together with 2K of subroutines, a 2K disk buffer and 2K user memory, fully utilised the available 8K memory.

When System One decided to build its own 64K Z80 system it was able to fit an 8K master operating system and five 8K user slots into the memory with plenty to spare. All applications are written in Z80 assembly language, broken into modules of less than 2K. The source code is jealously guarded.

The path followed by System One closely parallels that of an earlier successful Data General Nova OEM, Teledata, which developed a similar memory-efficient, multi-user system.

The System One and Teledata stories are instructive of some interesting system design considerations which are usually overlooked in an era of throwing cheap hardware at design constraints. It is often forgotten that 16-bit minis such as Nova share the same design limitation as 8-bit micros — an address space limited to 64K-bytes.

System One has reduced disk access requirements by the use of 2K-byte sectors. It has not as yet followed Teledata's course to shared re-entrant code to expand the number of users which can be connected simultaneously as well as reducing the need to load modules from memory. But System One has solved one problem which restricted Teledata's development by providing its own word processor called Letterwriter, which uses the same control codes as Wordstar.

System One production is running at 20 to 40 units a month with a target of one per man day. Software modules range from $395 to $850 providing a comprehensive range of accounting applications on a very economical system.

LABTAM THE PROFESSIONAL AUSTRALIAN

- ★ MULTI PROCESSOR
- ★ MULTI TASKING
- ★ NETWORKING
- ★ EXPANDABLE
- ★ RELIABLE
- ★ HIGH RESOLUTION GRAPHIC DISPLAY
- ★ SYSTEM SOFTWARE C/PM 2.2 M/PM 86 C/PM 86 ETC.

I CAN RUN YOUR EXISTING 8 BIT SOFTWARE
I CAN RUN YOUR 16 BIT SOFTWARE TODAY
AND 32 BIT SOFTWARE IN THE NEAR FUTURE

Victoria: 43 Malcolm Rd, Braeside, Victoria, 3195. Tel: (03) 587 1444
Tas. S.A.
Sydney: 65 Hume Street, Crows Nest, NSW 2065. Tel: (02) 439 5337
Brisbane: 2 Lincoln Street, Strathpine, Qld 4500. Tel: (07) 205 3666
Perth: W.J. Moncrieff Pty Ltd, 176 Wittenoom Street, East Perth, WA 6000. Tel: (09) 325 5722

Labtam INTERNATIONAL PTY. LTD.

Enter K072 on Enquiry Card

TIME

Time Office Computers Pty Ltd
6th Level, 99 Mount Street,
North Sydney 2060
Telephone: (02) 437 4355
Systems: T4000, T4500, E-Lan

TIME can lay reasonable claim to being the most succesful of Australia's business computer system manufacturers as at the third quarter of 1983. It has gone through a period of growth, the expenditure of $US2.5 million of venture capital, and re-establishment as a major part of the local scene based on its E-Lan concept of local area networking.

Time specialises in the design and manufacture of microcomputers and office network systems. It was originally formed in 1971 as Electronic Control Systems Pty Ltd by Michael Roberts, an engineering and science graduate of the University of New South Wales.

Following graduation, Roberts spent two years with Digital Equipment Corporation in the US. On his return to Sydney, he formed the company and set up a manufacturing facility in his basement to make computer terminals to his own design, which he sold and serviced himself. His first large contract was to supply and install a communications system for the Melbourne Stock Exchange which connected 320 brokers to the exchange's central computer.

A small 500-square-metre factory was opened in 1975 in Chatswood to manufacture terminals and the following year an intelligent terminal was added to the product range.

A Melbourne branch was opened in 1977 and a contract for the suppy of ECS inteligent terminals was awarded by Telecom. The same year production had reached a level that enabled ECS to initiate exports to the UK. This was a signficant development, for in 1978 exports to the UK had grown to $600,000. New clients in Lucas Industries, George Weston Foods, the CBC Bank and BHP provided a boost to production and late in 1978 the ECS 4500 microcomputer was launched.

Roberts returned to the US in 1979 for 18 months to establish ECS Microsystems Inc and was successful in raising $2.5 million in venture capital to set up the new company.

In 1981 a substantial contract for communicating word processors was received from the NSW Government Public Service and with an annual turnover in 1981/82 exceeding $3 million, the company moved into new head-office premises in North Sydney.

During 1982 the brand name Time took on more significance. It was decided to retain the ECS name for the manufacturing operations,but to change the trading name to Time Office Computers.

The first of the Australian Taxation Office contracts was won in September 1982, to supply 448 of the work stations which had been designed and manufactured at the Chatswood plant. This plant had reached its capacity and a new site was located in Artarmon. A new 2250 square metre manufacturing facility was officially opened in July this year.

This year a Canberra office has been opened and with the award of the second Taxation Office contract last month, turnover for the 1983/84 year will top $A18 million.

Exports have continued to provide growing revenue for the company and overseas offices in Papua New Guinea, London and New York were opened this year.

In the current financial year exports of Time equipment and services earnt the company $250,000. Next year, with orders under negotiation and signed agreements in hand, exports are expected to exceed $A2 million.

In 1981 the Industrial Research and Development Board granted $A300,000 to Time for the development of an advanced high-technology product. This was a project to develop a networking system and Winchester disk subsystem. This unique product made its appearance in the marketplace in December 1982, well ahead of its competitors.

Time is preparing to lodge another application for a grant to develop its new distributed processing system.

The Time Research and development unit is participating in LAN workshops with the Electrical Engineering Research Group (Warren Centre) at Sydney University and is establishing contacts with Telecom research and is keen to work with other research bodies.

WEBSTER

DD Webster Electronics Pty Ltd
17 Malvern Street, Bayswater, Vic 3153.
Telephone: (03) 729 8444
Systems: Spectrum Eleven (various)

WHILE building its success on the base of DEC's market dominating PDP-11 architecture, Australian design expertise has enabled Webster to out-micro the microcomputer manufacturers packaging its most recently developed 16-user, 1M-byte RAM, 60M-byte disk, streamer tape backup model in its standard 50 x 48 x 22cm, 38kg desktop box which is used for the main Spectrum range.

As well as PDP-11 compatible Spectrum Elevens, Webster manufactures video terminals and board-level products. The company has established a reputation for reliability and support and has attracted many local software OEM companies who package Spectrums with their own industry-specific software to produce turnkey solutions.

As well as the frontline HR, GT and LT models, Webster continues to supply and support systems including floppy disk, ½in magnetic tape and up to two 132M-byte disk drives.

One of Webster's greatest gifts to the industry is its systematic model numbering scheme. Two single letters identify the disk type (H, G, L, K or J from 8.5 to 132M-byte) and backup medium (C, R, T or M). A double digit identifies the processor (11 is LSI-11/2 available only for single-user 64K-byte systems, 23 and 33 are two speed ratings of multi-user LSI-11/23), single digits give the memory capacity (from 2 for 64K to 7 for 2M-byte) and cabinet style (desktop or free standing.)

Webster built its success in its Melbourne home market before expanding to Brisbane. It was not until it had found some overseas markets that it made a serious attempt in Sydney, recognition of Sydney company Digital Electronics' comparable success with PDP-11 based systems in that city.

While company founder David Webster is widely recognised as a pioneer of the industry, less recognition is usually given to the role of his wife Faye in the company's success. She is responsible for the company's public relations and has played a key role in creating their image of success

Despite Webster's free-marketeer stance against tariffs and industry assistance, it has had greater success in government and other publicly funded markets than almost any other local manufacturer. It was placed on the Victorian government's list of only two preferred suppliers for microcomputers.

The most important single application package in Webster's success story has been Monash University's Educational Computer System (Monecs), a software package comprising operating system, integrated set of compilers and applications programs. Monecs was one of the earliest cost-effective systems for providing student access to computers, with students preparing program and data decks using pencil marked cards and operating the equipment themselves.

More than 100 Monecs systems are in use throughout Australia and overseas, each with the ability to run between 100 and 200 student programs per hour, allowing students to get three or four runs each in a normal classroom session. Experience at Monash indicates that a Monecs system provides resources for up to 500 students.

The major peripheral products designed by Webster are the ST97 video terminal compatible with DEC's VT100, and the SZV11 eight-line multiplexor board.

While Webster has been in the business over 13 years and has not gone through any of the traumatic changes of direction which have afflicted some of the other pioneering Australian manufacturers, it has not grown to be quite as big as a couple of the more aggressive local companies. One factor in its relatively slow but steady growth has been the determination to be self-funding, so the business has remained in the control of its founders.

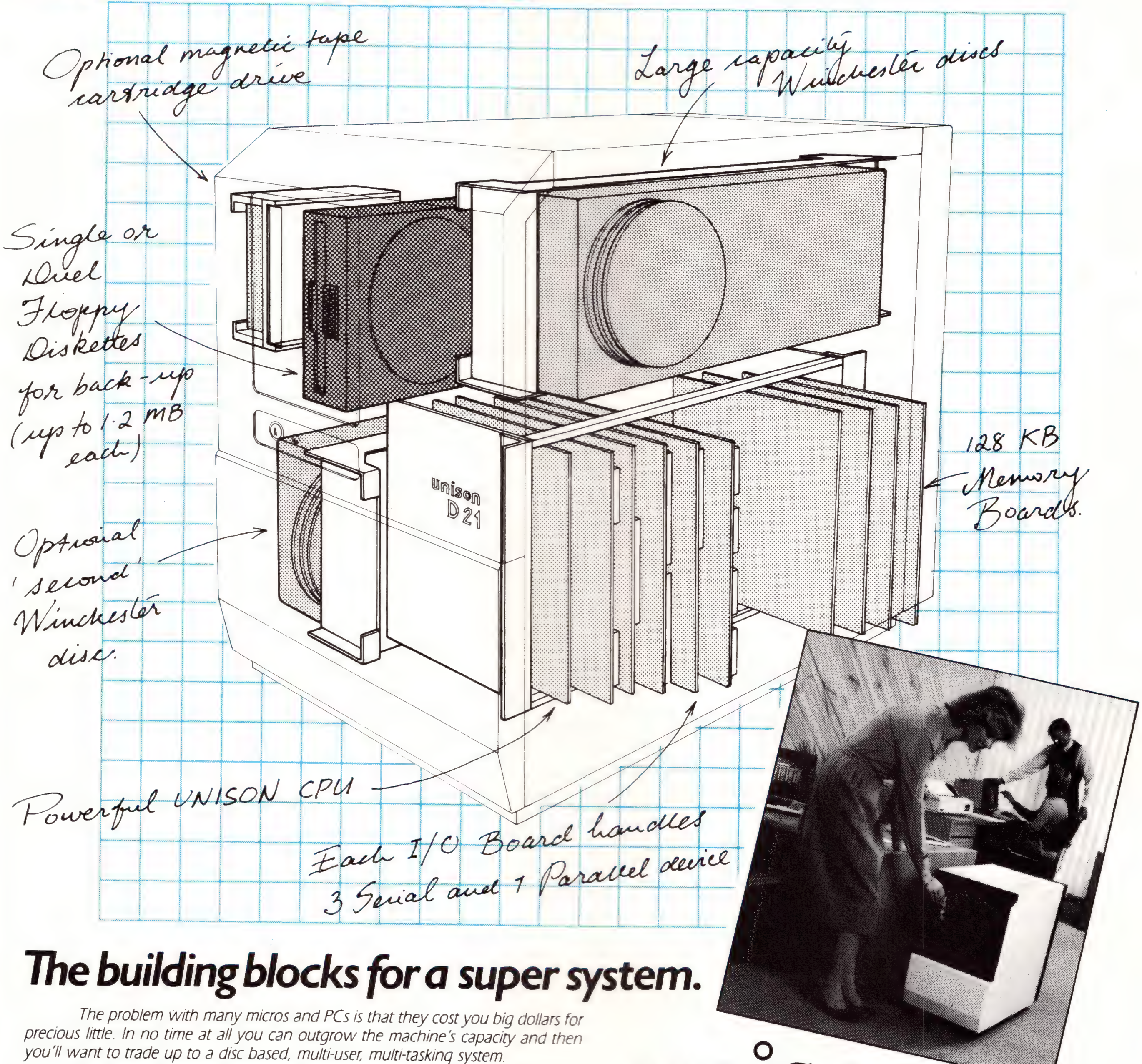
While the reliance on DEC's PDP-11 architecture has served Webster extremely well, now that even DEC is comitted to move away from it towards the higher powered VAX, a major question looms as to how long Webster can maintain its present strategy. The choice and introduction of a completely new line of products must be expected from Webster over the next two to three years and should be worth watching closely.

Acknowledgements

AUSTRALIAN MICRO sincerely appreciates the assistance of the many people who helped make possible this supplement on Australia's microcomputer manufacturing industry.

- Staff of the Information Technology branch of the **Federal Department of Science and Technology,** for their considerable assistance in the task of identifying manufacturers.
- **Simon Feely and Co.,** the public relations consultants to ACEMA.
- The **Hon. Barry Jones MHR, Dr Caelli** and Messrs **Dunlop, Hartley, Roberts** and **Webster** for their contributed opinions.
- The thirty-one companies who supplied the information on which their profiles have been based, as well as the several other companies who responded to an invitation to contribute but were assessed by Micro as being outside the general-purpose computer market. (Those companies will be covered at the first opportunity.)
- People associated with **Public Access Computing** for their assistance with ideas and the data preparation for the supplement.

unison
SUPERMICRO


Optional magnetic tape cartridge drive
Large capacity Winchester discs
Single or Dual Floppy Diskettes for back-up (up to 1.2 MB each)
unison D21
128 KB Memory Boards.
Optional 'second' Winchester disc.
Powerful UNISON CPU
Each I/O Board handles 3 Serial and 1 Parallel device

The building blocks for a super system.

The problem with many micros and PCs is that they cost you big dollars for precious little. In no time at all you can outgrow the machine's capacity and then you'll want to trade up to a disc based, multi-user, multi-tasking system.

And that's when you'll wish you had bought a UNISON. UNISON gives you more ***GRUNT*** *for your money with an MC 68000 based CPU and SIRONIX* operating system. Plus it's got a full selection of software development tools like a* ***relational database management system, office automation environment, spreadsheet calculator, forms package, modeller, mainframe communications and languages.***

And if you need more, like some mature COBOL and BASIC application modules, UNISON has these too.

UNISON supermicros start at around the same price as a top end micro and can build into systems with the performance of a mini.

Interested... then contact Email Computer Systems on (03) 728 1888 or see us in action at the 10th Australian Computer Conference (Melb, Sept 27-30). Alternatively, send in the coupon for more information.

**SIRONIX is an Australian product derived from UNIX System 111 and Version 7. UNIX is a trademark of Bell Laboratories.*

EMAIL COMPUTER SYSTEMS *Cnr. Canterbury & Liverpool Roads,*
Kilsyth, Vic., 3137

unison
A totally Australian system.

Send me full particulars on how to build a UNISON System.

*Name*________________________________

*Position*________________________________

*Company*________________________________

*Address*________________________________

*Postcode*________________ *Telephone*________________

Email Computer Systems
P.O. Box 154, Mooroolbark, Vic., 3138

AMC — UNI — 001

LUCAS/5641/LAL

Enter K071 on Enquiry Card

Australian microcomputer manufacturing:

COMPANY NAME	BRAND NAME	PRICE	PROCESSOR	OPERATING SYSTEMS	USER RAM	MASS SYSTEMS
Abacus International	Century 500	$3500-$10,000	Z80A 8085	CP/M, BBasic	64K	1.58Mb
Abacus International	C800	$5000-15,000	Z80A, 8085	CP/M, BBasic	64K	2.5Mb
Abacus International	C1000, C4000	$5500-$25,000	(1-17) Z80A	TurboDOS	256K	10Mb
AED Computers	Supercomputer 1	$7000-$10,000	Z80	CP/M	64K	2.4Mb-17.2Mb
AED Computers	Universe Supercomputer 2	$10,000-$13,000	68000, 8086 Z80A	CP/M, CP/M-86 IOS,MultiOS, MP/M, MP/M-86	64K-1Mb	3.6Mb-20Mb
AED Computers	Pulsaed	$4000-$6000	Z80	CP/M, MP/M	64K-320K	2.4Mb-17.2Mb
Amust	Executive 816	$3000	Z80A	CP/M	64K	2.4Mb-3.6Mb
Applied Technology	Microbee 16K	$499	Z80A	Microworld Basic	16K	Upgrade
Applied Technology	Microbee 32K	$599	Z80A	Microworld Basic	32K	Upgrade
Applied Technology	Microbee 64K	$699	Z80A	CP/M 2.2	56K	400K
Ausdata	Ausdata 100	$4500-$6500	Z80	CP/M 2.2, CP/M 3.0	64K-128K	800K-3.2Mb
Comprocessing	Australis	$6000	2 x Z80A	CP/M 2.2	64K	1.92Mb
Comprocessing	Sprite	$4500-$35,000	Z80A per user	MDOS	64K per user	2Mb-40Mb
Compsoft Manufacturing	ROSI 65	$1500-$3000	6502	UCSD P-System CompDOS	50K	80K-1.2Mb
Computer Manufacture & Design	CM2	$20,000-$35,000	68000	CMADOS	2Mb	2 x 300Mb
Computer Manufacture & Design	CM22	$35,000-$80,000	proprietary mini	CMADOS	2Mb	1200Mb
Computer Manufacture & Design	CM202	$80,000-$200,000	proprietary mini	CMADOS	2Mb	1200Mb
Computer & Industrial Electronics	ET88	$5000 +	8088, 8089 68000	CP/M-86	128K	1Mb-40Mb
Datamax	Datamax 8000 FD	$3500	Z80A	CP/M, CP/M 3.0	64K-256K	2Mb
Datamax	Datamax 8000 HD	$6000-$8000	Z80A	CP/M, CP/M 3.0	64K-256K	10Mb-45Mb
Datamax	Datamax 8000 MHD	$7000-$9000	Z80A	MP/M	256K	10Mb-45Mb
David Hartley Computer Australia	Hartley 3900	$7000-$15,000	8086	proprietary MS-DOS	128K-874K	720K-10Mb
Dedicated Micro Systems	DMS4100	$3800	Z80B	CP/M 2.2, MPMII	128K	1.2Mb
Dedicated Micro Systems	DMS4105	$4500	Z80B	CP/M 2.2, MPMII	128K	2.4Mb
The Dewhirst Corporation	Dewhirst DBM	$4000-60,000	Z80B per user Z80A	TurboDOS	64K per user+ 64K-1Mb	1080Mb
Dulmont	Magnum	$2000	80186	MS-DOS	256K CMos	2 x 320K Option
Eracom	ERA-60	$5000-$20,000	8085	CP/M, MP/M UCSD P-System	128K-512K	100Mb
Eracom	Era-80	$12,000-$40,000	8086 8087	CP/M-86, Xenix MP/M-86	1Mb	500Mb
General Electronic Developments	Centinent	$10,000-$20,000	2 x Z80A	TurboDOS	64K	2.4Mb-600Mb
General Electronic Developments	System 85	$5000-$15,000	2 x Z80A	TurboDOS	64K	2.4Mb-600Mb

the companies and their products

COMPANY NAME	BRAND NAME	PRICE	PROCESSOR	OPERATING SYSTEMS	USER RAM	MASS SYSTEMS
Labtam International	Labtam 3006	$6000-$8000	Z80A, 8086	CP/M, CP/M-86	256K-1MB	2.4Mb-10Mb
Labtam International	MU 3000	$18,000-$28,000	Z80A, 8086	CP/M, CP/M-86	384K-1Mb	10Mb-150Mb
L & L Australia	Unison	$15,000-$45,000	MC 68000	Sironix	256K-2Mb	10Mb-160Mb
Macpro Computers	System 250	$7950	Z80	CP/M	64K/320K	2 x 1.29Mb
Macpro Computers	Network 1250	$15,750	Z80	MP/M	320K	10Mb
Macpro Computers	MBS-80	$3295	Z80	CP/M	64K	2 x 1.292Mb
MF Computers	MF 2000	$2995	Z80A	CP/M	64K	2.4Mb
MF Computers	MF 4000	$5995	Z80A	CP/M	64K	5Mb-19Mb
Mica Associates	V252-IWS	$6200-$9000	8088, Z80A	CP/M-80 CP/M-86	128K-256K	2Mb-30Mb
Mica Associates	V212-RWS	$3200-$4000	8088, Z80A	CP/M-80 CP/M-86, CP/Net	128K-256K	—
Ortex Australia	Pascal System 1	$6100-$23,000	Microengine F&G	UCSD P-System VER. 3	128K	1Mb-600Mb
Ortex Australia	ADA System 1	$16,000-$33,000	Microengine	ADA	128K	1Mb-600Mb
Ortex Australia	Net 186	$4800-$10,000	80186, 80586	MPM-86, Sironix UCSD P-System	128K-512K	1Mb-40Mb
Ortex Australia	Micro Mainframe	$12,000-$50,000	80286, 80186 80586, 8089 80287	MP/M-86 Sironix	1216K-16Mb	21Mb-600Mb
Pericomp Computers	Pied Piper	$5000-$13,000	Z80	CP/M, MP/M	64K-256K	760K-20Mb
Precision Micro Systems	Series 808	$6000	Z80A	CP/M, MP/M	64K	2.56Mb
Precision Micro Systems	Series 808/HD	$8500	Z80B	CP/M, MP/M TurboDOS	64K	10Mb-70Mb
Progeni	Poly-1 Console Microcomputer	$3275	6809	Polysys	64K	—
Progeni	Proteus	$3900	6809, Z80	Polynet	64K	1.2Mb
Pulsar Electronics	6005T	$4000	Z80A	CP/M, MP/M	320K	2.6Mb
Pulsar Electronics	6005HT	$7000	Z80A	CP/M, MP/M	320K	15Mb
R.D.M. Computers	RDM-1	$5000	Z80A	CP/M 3.0	256K	2 x 790K
R.D.M. Computers	RDM-2	$6800	Z80A	CP/M 3.0	256K	1 x 5Mb 1 x 790K
R.D.M. Computers	RDM-3	$6000	Z80A	CP/M 3.0	256K	2 x 1.2Mb
R.D.M.Computers	RDM-4	$8000	Z80A	CP/M 3.0	256K	1 x 1.2Mb 1 x 10Mb
SME Systems	Titan TMC-150	$5000-$7000	Z80A	CP/M 3.0	256K	20Mb
SME Systems	Titan TMC-200	$7000-$10,000	Z80A, Z80B	CP/M 3.0	256K	20Mb
SME Systems	Unicorn Multi-user MPU-150	$5000-$20,000	Z80A, 8086	CP/M 3.0	384K	512Mb
SME Systems	Unicorn Multi-user MPU-150	$6000-$40,000	Z80A, 8086	CP/M 3.0	384K	512Mb
System One	Model 500	$3850	Z80A	proprietary or CP/M	64K	—
System One	Model 550	$5295	Z80A	proprietary or CP/M	64K	1.4Mb
System One	Model 800	$8600	Z80A	proprietary or CP/M	64K	4.2Mb
Time Office Computers	T4000	$2000-$3000	Z80	CP/M	16K	N/A
Time Office Computers	T4500	$4500-$7000	Z80	CP/M	96K-256K	2Mb-15Mb
Time Office Computers	E-Lan	$6000-$11,000	Z80	EON	256K	30Mb-50Mb
DD Webster Electronics	Spectrum Eleven	$5000-$50,000	LSI-11	RT-11, TSX + RSX-11M +	64K-4Mb	2.52Mb-264Mb

How our manufacturers measure up

Manufacturer	Date Founded	No of Employees	Turnover 1982/83*	System integration/assembly	Circuit board design	Government-funded R&D	Board stuffing/soldering	Original systems software	Direct retailing
Abacus International	9/1976	6	$560,000	*	*		*	*	*
AED Computers	1979	14	$800,000	*	*	*	*	*	*
Amust Computer Corp Aust	2/83	22	$3,500,000	*	*	*		*	*
Applied Technology	1973	50	—	*	*		*	*	*
Ausdata	1973	20	—	*	*			*	*
Comprocessing Computer Systems	7/1979	8	$250,000	*	*		*	*	*
Compsoft Manufacturing	6/1980	5	—	*	*		*	*	*
Computer Manufacture & Design	7/1976	52	$2,000,000	*	*	*		*	*
Computer & Industrial Electronics	12/1980	7	$300,000		*			*	
Datamax	1981	12	$1,000,000	*	*	*		*	
David Hartley Computer Aust	2/74	130	$15,000,000	*	*	*	*	*	*
Dedicated Micro Systems	1981	3	$200,000	*	*		*	*	*
The Dewhirst Corporation	10/1980	10	$450,000	*	*		*	*	
Dulmont Electronic Systems	5/83	20	—	*	*	*	*	*	*
Eracom	6/79	15	$1,000,000	*	*		*	*	*
General Electronic Developments	6/79	—	—	*	*		*	*	*
Labtam International	1972	48	$3,000,000	*	*	*	*	*	*
L & L Australia	10/1981	100	$10,000,000	*	*	*	*	*	*
Macpro Computers	1/83	6	—	*	*			*	*
MF Computers	8/1980	6	$250,000	*	*	*	*	*	*
Mica Associates	11/1980	12	—	*	*	*			
Ortex Australia	11/1978	6	$250,000	*	*	*	*	*	*
Pericomp	1979	15	$1,000,000	*	*	*	*		*
Precision Micro Systems	2/1979	4	$500,000	*	*			*	
Progeni	15/1968	150	—	*	*	*		*	*
Pulsar Electronics	2/1980	15	$1,000,000	*	*	*	*	*	*
R.D.M. Computers	5/1982	6	—	*	*		*	*	*
SME Systems	10/1976	12	—	*	*	*	*	*	*
System One	1/1967	44	—	*	*	*	*	*	*
Time Office Computers	1971	103	$10,000,000	*	*			*	*
DD Webster Electronics	4/1970	35	$3,000,000	*	*		*	*	*

* Manufacturer's estimate

A request to other companies

AUSTRALIAN MICRO wishes to hear from any other companies which feel their activities fall within the scope covered by this supplement, so that they can be kept on file for future coverage. In addition, Australian Micro will be publishing a supplement on companies involved in the Australian design and manufacture of computer-based communications systems, circuit boards, peripherals and application specific hardware. Companies active in those areas are invited to submit product and contact information.

Seven MicroVisions

Future prospects for an emerging industry from ACEMA, Bill Caelli, Damien Dunlop, David Hartley, Hon. Barry Jones MP, Michael Roberts and David Webster

Australian Computer Equipment Manufacturers' Association

ACEMA, the Australian Computer Equipment Manufacturers' Association, has been formed by more than 20 companies in the Australian computer design and manufacturing industry.

There are other groups representing sectors of high-technology industry, but ACEMA is the first to bring together the leading companies involved in the design and manufacture of computer hardware.

ACEMA was formed because the main Australian companies involved in computer manufacturing believed it was important that the Australian industry be encouraged. Australia would achieve considerable import savings, be less reliant on imported technology and obtain significant national economic benefits.

ACEMA's main objective is to "develop and foster a competitive, Australian-based, computer equipment design and manufacturing industry". It has several subsidiary objectives, including providing a "source of professional and technical advice for Government and others on matters related to high technology industry in general, and computer equipment design and manufacture in particular".

ACEMA believes it can act as an important source of information and policy development assistance to the government. Its member companies are experienced in all facets of the computer industry.

Membership of the association will be open to any company involved in the design and manufacture of computer equipment in Australia with more than 50 per cent Australian equity. Companies which do not strictly meet these criteria may be admitted to membership by special resolution of the ACEMA board and a 70 per cent vote of all members. While it is difficult to be stringent in the application of membership criteria, the association is committed to ensuring its Australian nature.

ACEMA is company limited by guarantee. It is managed by a board of directors elected from member companies.

It does not have a secretariat or permanent staff. It does have a secretary who acts as the administrator of the association's activities and who reports to the board.

ACEMA has prepared a submission to the Industries Assistance Commission inquiry into the Australian computer industry. It is also responding to commission requests for information about its activities and the nature of the Australian industry.

ACEMA has contacted the Government in relation to certain computer tenders. The urgency of the situation was such that the association believed it necessary to telex the government outlining its concerns. Association members are working with government departments to implement buying policy changes.

ACEMA believes its objectives can be best met by having representatives from its member companies undertake the bulk of its activities. These are the people who are expert in industry economics and technology.

They are the most likely people, therefore, to be able to meet the information and policy guidance needs of Government and industry. The ACEMA board is:

President, Damien Dunlop (CMAD); vice-president, Paul Edwards (Digital Electronics); vice-president, Graham Cole (Scitec Corporation); director, Barry Davis (Xitel); director, David Hartley (David Hartley Developments); secretary, Ron Burke (Consultant).

The association can be contacted via the secretary, PO Box 105, Vermont, Victoria, 3133. Tel: (03) 873 5636.

ACEMA Members

Companies seeking membership of ACEMA should write to the secretary outlining their activities and assessment of whether they meet the required criteria. The application will be referred to the association's board for review. Applicants will then be contacted and advised of membership fees and other relevant matters.

Baber Enteprises Pty Ltd
Electro-Medical Engineering Pty Ltd
Torrens Industries Pty Ltd
ERACOM
Scitec Corp Pty Ltd
Xitel Pty Ltd
Computer Manufacture and Design Pty Ltd
Deltec Pacific
Digital Electronics
David Hartley Developments Pty Ltd
Summit Electronics Systems
General Technology
Raytheon International
MICA Associates Pty Ltd
Time Office Computers
L & L Australia Pty Ltd
Cybergraphics Systems Pty Ltd
GED (Sales) Pty Ltd
Labtest Equipment Co
Techway Pty Ltd
Datacraft(Aust) Pty Ltd

David Webster
Managing Director, DD Webster Electronics

ALTHOUGH Webster Electronics was founded and is based in Australia, we have always viewed ourselves on fairly equal terms with our major competitors, the overseas manufacturers selling 16 and 32-bit minis here.

We have rarely tendered for a contract in direct competition with another Australian manufacturer, but as Australian-built computers make up less than 1 per cent of those sold on the market here this is hardly surprising. Our market research centres on our primary competition, and this limits our expertise in what our Australian colleagues are up to. It is inappropriate for us to judge and generalise about them.

We can confidently say, however, that while our indigenous industry is small, it is certainly possible for an Australian computer builder to succeed and make significant technological contributions, as a number have already done. The major factors limiting our growth as a company are Government interference at a multitude of levels, the rate of availability and our capacity to train good staff, the timeliness with which we can exploit new technology and funds availability.

I believe these problems are not peculiarly Australian, but face any viable computer manufacturer of whatever size in the world today. The special problem limiting the growth of technology, or indeed any form of productive enterprise, in Australia is the taxation-conditioned preoccupation of our entrepreneurs with mining, farming, real estate and Australian films.

At Webster Electronics we have never been limited by lack of availability of technical information or components. We have access to the same press announcing the latest technology that our overseas competitors read. This information and supply is no less available to me, than any other competitive US or Australian designer wishing to pursue it.

It has always been our aim to be innovative on an international level, and while the establishment of a Webster Electronics US base in 1980 has facilitated this in recent years, we had several "world firsts" even before that.

In the early 1970s we built a PDP-11 disk controller. Even DEC did not have this product at the time.

A floppy disk subsystem was designed and launched by Webster Electronics in 1975, compatible with PDP-11, Interdata and Data General minis. Of course, these manufacturers later produced their own versions, but we beat them all to the marketplace with such a product.

I mention these examples merely to reinforce my point that the world's latest developments in component technology are available to any manufacture to use as it sees fit. When Webster Electronics launched its first Spectrum minicomputer in 1977, a tabletop machine with 630K-bytes of disc storage and a 64K memory, this computer had a better performance per dollar than any other machine in the world, including DEC.

Within two years we had quadrupled the storage density in the same size box and were still leading the world in packing density. This month we will release another world first, the Spectrum Model LT.

Damien Dunlop
Managing Director, Computer Manufacture and Design

IN a country with arguably the world's most competitive computer market — as US, Japanese, European and Australian companies vie for a limited number of potential sales — it's time for loose relationships and other affairs of the past to give way to formal, lasting relationships.

A successful marriage, between business and science, is required. Business must provide the venture capital, management and marketing skills while science provides the technological skills.

The Australian computer industry, particularly the microcomputer sector, will realise its full potential, enhance employment opportunities and guarantee an export economy in our region of influence given venture capital support. The Espie Committee report says so, Barry Jones says so and John Cain says so.

Senator Button and his State ministerial counterparts responsible for labor, industry and commerce also say so. As do several of the country's leading economists and commentators.

If Australia is to maintain more than the status of a third-rate country, overtaken in terms of economic growth by our near neighbors, we must develop our high-technology manufacturing capability. We must think more than merely "high tech" — we must think and act "high-touch".

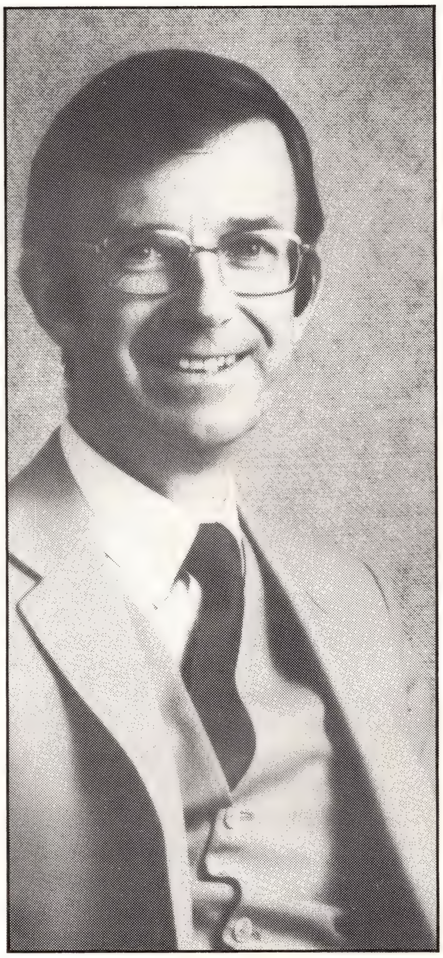
We must be interactive and develop products in the technology area that are interactive and enhance employment opportunities.

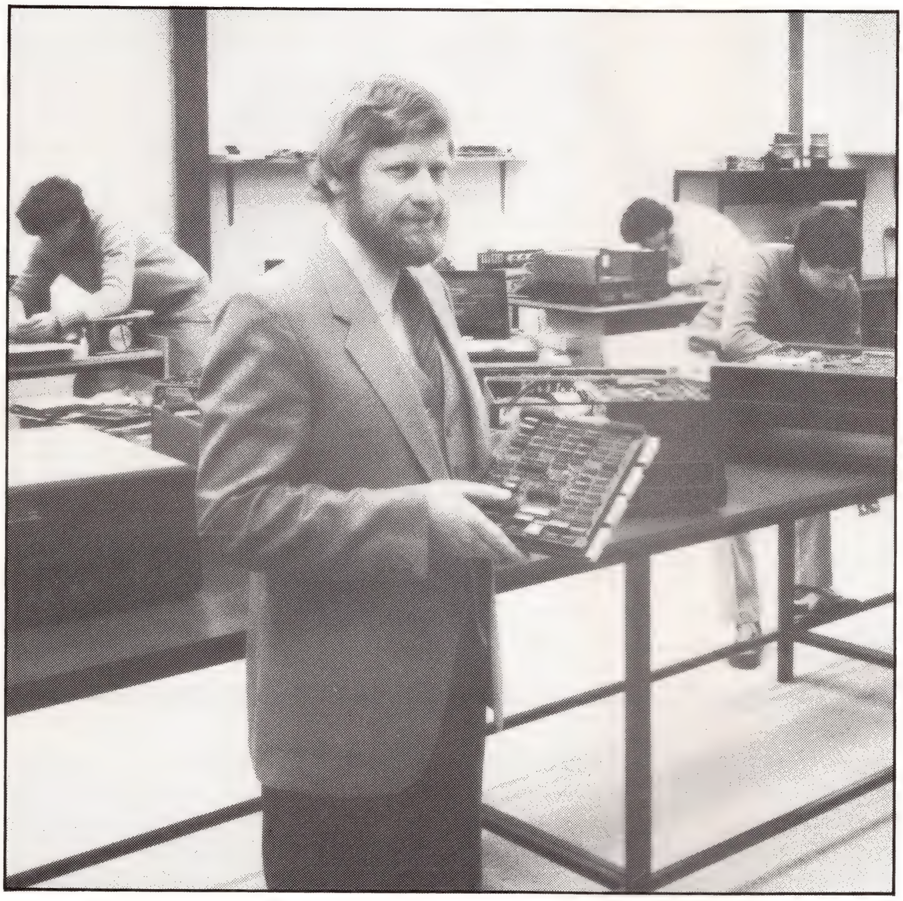
We must provide solutions to business problems. Australia's computer industry can help lead the recovery.

The industry in Australia employs 30,000 people. It has an annual turnover of more than $4000 million. The industry contributes about $1600 million to gross national product.

All this is before the industry's honeymoon has even begun and before the issue of interactive technology has really been addressed. In the United States venture capital groups provide equity for projects at a very early phase, when there are few assets and no cash flow to provide collateral for debt financing.

But most of the companies surveyed





The box-size is unchanged since 1977, but it now stores 60M-bytes, 100 times the original. It has a memory of up to 1M-byte and will run a maximum of 16 simultaneous users. I know of no other manufacturer, either here or overseas, with a tabletop computer of such capacity.

In the Australian industry we often hear complaints about limitations in component availability, infrastructure and lack of venture capital, but I have never really felt any of these to be a problem. Supplies are usually obtained in a timely fashion through our US office, and any sub-contract service work such as board etching, circuit board assembly or metal work is readily available locally.

While I would concede that we perhaps don't have as easy access to the equity market as a comparable manufacturer in the US, I personally, would not accept this anyway, as I am now too firmly entrenched in doing my own thing ever to allow a venture capitalist to steer me.

Our access to loan capital is sufficient to allow us to grow at the limit of our capacity to adapt.

by Sir Frank Espie's committee said they faced great difficulty trying to get finance for development of high-tech products in Australia. The Australian Scientific Industry Association (ASIA) supports the need for an Australian high technology industry in a recent paper which also identifies the severe deficiencies in Government support of high and new technologies.

Victorian Premier, Mr John Cain, recently said: "It's not surprising that governments the world over seem to be falling over each other to get on the high-tech bandwaggon." And his Government is reviewing the whole area of computing services, through a committee established by the Minister for Public Works.

The Victorian Government is also looking at ways it can be involved in the provision of venture capital in partnership with private enterprise. At a meeting in June of all State and Territory ministers and the Federal Minister for Industry, Senator Button, the findings of the Espie Committee were again endorsed. So the engagement period has well and truly begun.

The marriage will be consummated when the relevant tax-deductability package is made available.

Michael Roberts

Chairman, Time Office Computers

IF local industry means Australian owned companies which design, manufacture and sell computer hardware and software — as distinct from subsidiaries of large international corporations which simply assemble their overseas-designed products — I view the present situation with concern.

A number of factors continue to erode the ground on which a small number of local manufacturers stand. In order of importance these are:

☐ A declining number of essential support industries, ranging from electrical component manufacturers to metal fabricators and plastic molders.

☐ An increasingly sceptical financial community, which in spite of an awareness of the need to develop science-based industries plays the same old game it has since 1980 — seesawing its investment policy between bricks and mortar and the stock exchange.

☐ The parties continually talk about supporting local technology. If there is any government policy concerning support for local science-based industries, it is not very visible.

The only good thing to be said about all these negative factors is that the crisis situation we are sliding towards will precipitate radical changes.

All this is so depressing because we have so much opportunity in this country. We have thousands of engineers and scientists, not fully utilising their talents.

We have managers who have learnt their craft in the large corporations, understand the Australian marketplace and are ready to lead these new technology corporations.We have the capital and a nursery-like marketplace, which is excellent for nurturing fledgling products.

As well as this, there are some courageous senior managers in our Government agencies who are prepared, in spite of the risk to their own careers, to put their faith in Australian-produced equipment in the absence of specific policy direction. We have a research and development grants policy which can be used immediately to seed developments.

We need to avert a total collapse in our local industry. We need the vision to make a commitment and stick to it so that this country will have a future.

Bill Caelli
Managing Director, Eracom

THERE is this unusual problem. Australia has a computer industry but it is rather hard to find. It has been ignored in the past in government purchasing policy and it has struggled along against rather massive opposition from entrenched importers.

After all the rhetoric, then, is there any sign of development? The answer is yes. Is it in the right direction? The answer is — maybe yes but most likely no. What's up then?

At present, Australia's computer industry is almost totally oriented towards import replacement. You know, take a Z80 or 68000 chip, add CP/M or Unix, stir it onto a printed circuit card and

Barry Jones
Minister for Science and Technology

AN Australian company is generally credited with being the first in the world to build a microprocessor-based computer in the mid-1970s. While we have to date failed to capitalise fully on this innovation, I see micro and mini computers as one of the key sunrise industries on which Australia's technological future depends.

At last count, over 40 Australian companies were designing and manufacturing micro and mini computers. These companies span a broad spectrum from backyard operations to companies running their own factories and employing 50 or more people.

They produce a range of products covering diverse market niches — from school computers to industrial controllers and business computer systems. These products are almost universally characterised by their inventiveness and technical excellence.

The companies also share a range of common problems: access to finance, shortages and delays in electronic component supplies, and, until recently, the lack of a co-ordinated industry voice. The Australian Computer Equipment Manufacturers Association is an important step towards such a voice for local manufacturers.

The Government has recently announced a major study to identify the main areas of Australian competence in applied micro-electronics.

The resulting report will provide important intelligence for Australian companies and will give the government the opportunity to ensure that its wide range of policies and programs which affect this industry are focused and co-ordinated for greatest impact.

A recent survey by none other than IBM found that over 60,000 peole are employed in the computer industry in Australia, local and multinational. Of this, around 13,000 are employed by the software industry, with the remainder in the marketing, service and hardware sectors.

Of these, 60,000 less than 8000 in the last census claimed a computer science qualification. The Australian Computer Society sees a backlog of 20,000 man-years of programming, and a shortfall of 2000 programmers a year over and above present supply. I see this as a major challenge to the educational system to supply this demand for highly trained manpower.

Finally, and perhaps most important of all, we need to develop our marketing skills. In the past we have successfully sold our primary produce and the output from secondary industry across the world.

It is now time for Australia's home-grown computer industry to sell to the world the high-technology equipment we have demonstrated we can produce.

"serve". The chips, the sockets, the connectors, the printed circuit board material and most importantly, all those diskette and disk drives, are fully imported.

The point is that Australia's computer industry must function against a background of an almost non-existent electronics component industry — the infrastructure, as they say, isn't there. If it existed at all, it died in the 1970s. No one cared — least of all the public sector.

So what next? The obvious thing then is to maximise the value-added or high-tech bit of the computer and that means a move to system software, VLSI chip creation and powerful systems.

Yes — mainframes. The personal computer is now a consumer item made in South-East Asia, and application software is being written cheaply in India.

Australia must turn to "power". Our direction has to be towards powerful information systems with system software made here, sold here and exported.

After all, if the value of that 68000 chip is $100 then the licence fee sent overseas for the copy of Unix let alone the other compilers, text processors, interpreters, data-management and the like far outstrips the chip price.

Australia's future lies in making large systems where the value of the central processor or the parallel processor or the Vector processor has some relation to the imported disk drives and data storage devices that surround it. The world hardly needs another Motorola 68000/Unix/MS-DOS/bit-mapped display system. Particularly from Australia.

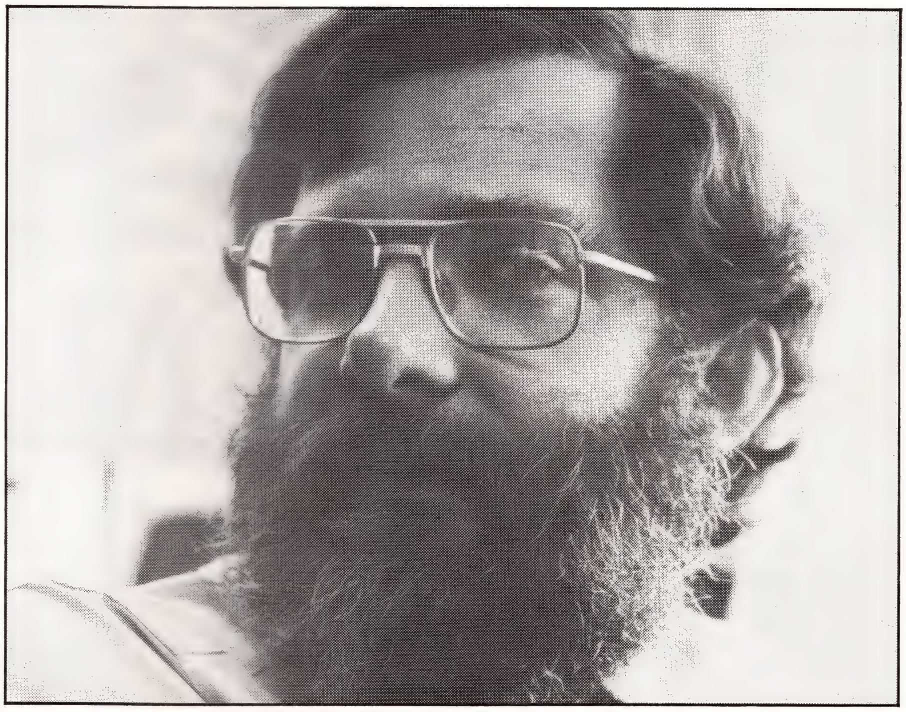
But, that is not to say that we cannot use them here. After all, we make cars and refrigerators and heaters and shoes, don't we?

All I'm saying is that to export those Unix type boxes is going to require a lot of marketing skills and cheap freight. If we are going to ship a computer overseas, let's go for some real profits and up that value, with system software content and added value.

After all, in the 1980s and the 1990s who's going to tell the difference between the hardware, the firmware, the VLSI design and the fifth generation software that holds the lot together? That's where we have to be — doing good business with integrated systems that make export sense. And that definitely does not mean writing some short-term application packages for fully imported micros.

David Hartley

Chairman, David Hartley Computer Australia



A YEAR ago when I spoke at the 9th Australian Computer Conference I was very pessimistic about the state and prospects of computer manufacture in Australia. In the year since, there has been a marked change of mood in Australia, if not yet in large concrete results, so that now I am cautiously optimistic.

In Hartley Computer's case we are undergoing boom success after restructuring with New Zealand and South British Insurance Group capital last December. Since January, we have shipped some 300 systems in the small-to-medium size mini range, with almost half of these going overseas to the United Kingdom, South Africa and New Zealand.

With our current products, including a 16M-byte Winchester four-terminal "personal micro" . . . we expect the boom to continue for us through 1983-84.

In general, though, the great imbalance in Australia between imports and local production still exists, despite our efforts and those of the other Australian manufacturers. The granting of the Department of Social Security tender to Wang and others was a continuation of the old practice of effective discrimination against Australian suppliers.

However, the recent few months have seen some real advances with the publishing of the Espie Report, the formation of ACEMA (Australian Computer Equipment Manufacturers Association) to provide a single voice for the local manufacturers, efforts by the Commonwealth Government to work towards some logical purchasing procedures that would enable Australian suppliers to at least compete on an equal level, the moves by the Schools Commission in considering Australian possibilities, the calling of the High Technology Summit in September, the inclusion of one Australian manufacturer (Eracom) in the list of preferred suppliers to the Defence Department, and, in general, the efforts by Barry Jones federally and others around the country to awaken interest in the high-technology question.

All these embryonic moves indicate a basic groundswell of opinion in the country that could, if nurtured properly, lead to 1983-84 being the point when Australia entered the high-technology race.

It can be done! Let all of us in the industry, in particular, keep pushing to make sure that we control, develop and manufacture a significant percentage of the technology that will increasingly embrace all of us.

Wanted!

For its mind. Not just its body.

The best looking, most intelligent and responsive 8/16* bit in town.

Introducing THE RDM Computer System

Here is the first serious, Australian designed and manufactured business computer. It uses as its base the Australian designed Aussie Byte Board, developed by R.D.M. Computers Pty Ltd.

This board is so advanced that other computer manufacturers are switching to it, rather than using imported boards in their own systems.

Protection of Software Investment

The RDM System will support many operating systems, therefore many applications packages.

The 8-bit system supports single-user CP/M 2.2, CP/M PLUS (Version 3) and multi-user MP/M II operating systems.

* RDM will soon offer an optional plug-on 16-bit board to support MS-DOS, Unix and CP/M-86 operating systems.

Hardware Flexibility

The RDM Computer System includes 256Kb of RAM, an adjustable, high resolution VDU with dedicated 64Kb of RAM and a separate keyboard with numeric keypad.

Standard connectors at the rear of the system allow for the addition of three terminals/printers, a Centronics printer and a modem. Upgrading is achieved by simply plugging in the desired peripherals.

Each system will support a number and variety of disc units — up to four 5¼″-8″ diskette drives AND up to four hard disk drives.

Additional System Functionality

In addition to multiple operating systems, terminals and disk drives, the RDM System can support a light-pen for CAD/CAM graphics, and, a speech synthesis option.

The Bottom Line

Whether you are a prospective end-user who wants a cost effective and expandable system or a software developer who requires the most responsive hardware to enhance your applications — you can't afford not to investigate the RDM Computer System.

RDM Computers Pty. Ltd.

225 High Street Northcote 3070
Victoria Australia. Telephone: (03) 481 0077

Enter K037 on Enquiry Card

Entrepreneur in tune with hobbyists' zeal

Owen Hill's Applied Technology has produced designs some might consider idiosyncratic to enable users to get close to the computer's internal environment.

TONY SMITH

BEHIND the unmatched success of the Microbee computer is the energy, pragmatism and trail of pressure points generated by a classic entrepreneur, Applied Technology Pty Ltd managing director Owen Hill. During an extensive tour of Applied Technology facilities, we managed to speak briefly to him at the Waitara office and then over the phone from the West Gosford factory. In the circumstances, a formal interview was out of the question, but the importance of Hill and Microbee to the Australian industry demands the recording of some impressions of those discussions.

Owen Hill's opinions about Applied Technology keep referring back to the hobbyist market, an area which he considers has given as much as it had taken from the development of the Microbee. He has an obvious empathy with people who want to get close to the machine and has produced designs some regard as idiosynchratic to enable users to get close to the computer's internal environment.

He projects the Microbee as an extended learning process, contrasting it to the throw-away experience of other lowend machines.

He concedes that in the longer term, Microbee too is working to put itself out of business by developing greater user sophistication than can sensibly be serviced by upgrades.

Many would testify to Hill's management of the business being based on entrepreneurial gut feel rather than extended planning. He drives himself so hard he is almost out of reach for much of the time and has had to break the company into divisions so they will get some management.

His financing of growth has been based on an economy in recession where even the largest suppliers are keen to talk turkey with anyone offering substantial orders. Semiconductor giant Hitachi has bent over backwards to accommodate the little Australian company which has been taking one month's production of its 6116 CMOS memory chips.

Of all the Australian manufacturers, Hill seems the least concerned about being Australian. He is proud that one of his key Hong Kong suppliers is a substantial subcontractor to IBM. His success with the NSW government buying authorities before most others started complaining of difficulties in these areas may have made him immune to such negative thoughts.

But, whenever it is advantageous, Microbee is proudly Australian, and that has done the company no harm in other educational decisions.

Next door to the Gosford manufacturing facility, Applied Technology is already building secure research and development premises. But Hill keeps his cards close to hs chest when discussing options for future designs. He certainly recognises the significance of the IBM PC driven pseudo 16-bit trend but somehow does not seem to have been able to bring it to terms with Microbee's hobbyist bent.

He is less retiscent about enhancements to the present Microbee range, where the growing band of committed users are building the kind of extensions that used to be the exclusive domain of Apple. Music synthesis, S100 bus extensions, joysticks and voice synthesis are just a few of those Hill saw as important.

The expansion facility of Microbee is extraordinarily suitable for nuts and bolts hobbyists, being simply a 50-pin buffered extension of the Z80 processor's own contacts.

At least three different levels of networking are being developed for Microbee, one in-house and two by users. Hill emphasises Microbee's potential for expansion with color graphics and software in ROM. He places much importance on market feedback from 30 to 40 dedicated users.

The greatest credit that Hill gives to Microbee for ensuring his company's future is its sales generation of a 10,000 mailing list for his bi-monthly eight-page user newsletter. ☐

DATASCAPE — *"The Printer Specialists"* —

For Sales and Service of NEC Anadex NDK

Printers Australia wide

DATASCAPE

Datascape Int. Pty. Ltd.
Sydney Office:
33 Grosvenor Street, Neutral Bay Junction N.S.W. 2089.
Telephone: (02) 909 1233, Telex: AA71150.

Melbourne Office:
27 Raglan Street, South Melbourne, Vic. 3205.
Telephone: (03) 690 3622, Telex: 30458.

Brisbane:
(07) 371 7366
Adelaide:
(08) 332 8666
Canberra:
(062) 80 5283
Hobart:
(002) 72 8622

Enter K008 on Enquiry Card

Still hunting for your dream computer?

One that will take many variations of software systems?

One that has incredible expansion capabilities?

One that is built for Australian climatic conditions?

The chase is over.

You need look no further than the FOX-640 Multi-system Computer.

With our innovative patented system slot, a major breakthrough in computer design, no longer are you limited to just one type of software. The whole market is yours to choose from. The air-circulation fan, an expensive extra on other units, is standard on the FOX-640. And just look at the list of expansion cards available.

Other features include LED warning light to ensure you don't inadvertently exchange expansion boards while the system is in operation; a powerful Z80 CPU keyboard, 13 pre-programmed keys for additional functions and attractive upper and lower case characters: There is also built-in twin speakers with volume control. Our FOX-DOS, exclusively written in Australia, is Apple-work-alike, but with many added special features.

And now, perhaps our most outstanding feature. Because the FOX-640 is built right here in Australia (under rigid quality control), we can offer you this amazing package for only $980 plus tax.

$980
PLUS TAX

STANDARD FEATURES

- 64K RAM
- 6502 Processor
- Full Z80 Processor for Keyboard
- Upper and Lower Case Characters
- 8 Expansion Slots with LED Warning Light
- 3 Systems Cards
- 13 Pre-programmed Keys
- Inbuilt Fan, Reset Lock
- Twin Speakers with Volume Control
- Joystick Port
- Numeric Keypad
- Full Cursor Control

OPTIONAL EXPANSION CARDS

- Printer Card
- I/O Card
- Graphics Card
- Z80 Card
- Language Card
- 16K RAM Card
- Floppy Disk Controller
- Buffer Card
- 80 Column Card
- Eprom Writer
- Disk RAM Card

Fox Computers

What do you think? If you're interested in this, or any of our other computer systems, come along to our showroom at 100 Hunter Lane, Hornsby — we're open 7 days.

Dealer enquiries welcome.

Telephone: Sydney (02) 476 4582, Melbourne (03) 529 1788, ACT (062) 47 2127
Brisbane (07) 397 0888 OPEN MON.-FRI. 9AM-5PM SAT.-SUN. 10AM-4PM

Post coupon to Fox Computers P.O. Box 203, Hornsby 2077

Please send more information on the FOX-640

Name . . . . Phone. . . . .

Address. . . . .

Type of business . . . .

Enter K014 on Enquiry Card

Labtam combines power with growth potential

Labtam, an Australian high-technology company, has released a multi-microcomputer called the Labtam 3000. MJ Clarke finds it a very powerful machine with great expansion capability.

LABTAM is a privately owned, all-Australian company which has been in the high technology of element analysis for 10 years.

It has been manufacturing computer controllers for its laboratory instruments for four years and has now developed a standalone microcomputer of considerable power and expansion capability, the Labtam 3000.

The model being reviewed is at the bottom end of a formidable range of configurations. The Labtam 3000 is a large desktop system which measures 535mm x 530mm x 370mm with a detached keyboard.

This micro comes fitted with Z80A and 8086 microprocessors on separate boards, each with 128K of RAM. The Z80A controls the disk I/O, track buffering, DMA and provides one of the RS232C ports. The 8Mhz 8086 provides 3 x RS232C ports, a serial and parallel printer port.

The high-resolution graphics capability, 800 x 600 pixels, is good by any micro standards. This is software selectable with four green/grey scales at 800x 300 resolution.

The system software to drive the graphics is a subset of the Regis system and is easy to use from Basic and other system software. Sending 'ESC [P400, 300] C[—100]' will place the graphics cursor at the centre of the screen and draw a circle of radius 100 pixels around the centre of the screen.

The features available include PAINT with 3 pattern registers available to select from, Polygon, Vector, ARC, Circle, Point and Text. Text can only be printed across the screen.

The fully programmable video circuitry can provide many fonts and includes RAM space for your own character sets. The terminal software can emulate VT 52 protocols and can give 80 or 132 print positions on the screen.

A 300mm (diagonal) display gives superb character size and there are no problems with operator eye strain.

The Hall effect keyboard with 103 fully programmable keys including cursor keypad to the left, numeric keypad to the right and 14 function keys is large, solid and comfortably styled.

It gives excellent tactile feedback and perfect bounce-free registration. The feel of this keyboard is as good as the top quality golf-ball typewriters. The fully programmable keys will enable the system to easily support foreign language and graphic character sets.

The review system was equipped with 2 x 1.2M-byte 8in floppy disks and a 800K-byte 5¼in floppy disk. This unusual combination will be appreciated by the user who wants capacity and format flexibility.

> *'Figures to hand indicate a Labtam is up to three times as fast as other 16-bit CP/M-86 micros'*

The floppy disk controller provides some unusual features. The 8in disk provides 1.2M-bytes of 1K sectors or 256K-bytes of IBM standard single sided, single density, industry standard diskettes, making available the large range of CP/M 2.2 software.

The 5¼in drive in its Labtam mode gives 800K-bytes but can read and write an expanding list of other manufacturers' floppy disks. This includes IBM PC, ICL PC, DEC Rainbow, Cromenco, Osborne, Kaypro and others.

The power supply uses transistor switched regulation. This provides graceful shutdown and mains fluctuation protection, giving user data protection to a standard unusual in the micro world.

The back panel provides an amazing array of connectivity. Four full RS232C ports, are independently programmable to 19.2K bauds Async. This high baud rate has been developed by Labtam for use in its scientific instruments.

Also included are one RS232C serial printer port, one parallel centronics port, a joystick controller, a network control and light pen control. I was not able to test out all of these facilities because of the lack of hardware devices and software, but I look forward to using a computer system with such extensive connectivity.

The availability of equipment that can be fitted into a Labtam chassis provides an impressive list: Winchesters from 5M-bytes to 150M-bytes (room for at least two), exchangeable 5M-byte disks, memory boards up to 1M-byte total system capacity and RS232C ports in multiples of eight per board.

The only limiting factor is the ability to cool all this extra hardware. Of course, if you wanted all of this hardware you could move to a 15-slot motherboard, floor mounted Labtam.

Future features include a Unix card using a 68010 processor, a high-resolution dumb terminal, a low-resolution color terminal, a high-resolution color terminal, an 80186 network controller, light pen, joystick and mouse.

The Labtam doesn't have sound generation capability, this is the only addition I would suggest to the designers. The fact that this Australian designed and manufactured computer, with a scientific user base worldwide, is virtually unknown in Australia, is surprising as well as shocking.

The operating system provided was CP/M-86 with a CP/M 2.2 emulator.

I had opportunity to test out the MP/M-86 environment using my own monitor as the second screen. MP/M-86 requires an extra 8086 card which comes with 128K-bytes of RAM and enhances the speed of this multi-micro.

The simple upgrade to the MPM/86 system required me to remove the lower case, disconnect three ribbon cables, slot in the extra 8086 card, reconnect the cables and cover and reboot from an MP/M system disk.

There is a battery backup realtime clock fitted so the time of day operations of MP/M are all functional.

The CP/M-86 and CP/M 2.2

emulator provided some shocks. Those of you who are familiar with a 48K-byte TPA will be envious when you discover the Labtam CP/M 2.2 TPA is 62K-bytes.

This is achieved by the 2K-byte full CP/M 2.2 emulator being the only software in the Z80A 64K address space. The speed at which CP/M 2.2 programs run has to be seen to be believed.

With a Z80A running at 5Mhz and the 8086 running at 8Mhz, controlling the screen I/O, and CP/M 2.2 functions, and taking into account the massive 48K-bytes of track buffering (112K-bytes if you have a hard disk) it was difficult to measure sensibly, comparisons between the Labtam 3000 and other micros.

Figures to hand indicate a Labtam is up to three times as fast as other 16-bit CP/M 86 micros. I have devised a benchmark which can exercise the full capacity of the Labtam, and hope to reveal the results of my investigations and comparisons with other systems' performances in a future issue.

Installation of the system was simple and straightforward. The only criticism of the hardware was the less than robust connector from keyboard to computer, which the manufacturers intend to replace when supplies of a more rigid connector are available.

The power-up sequence requested

australian Micro computer magazine

Hardware Report Card

Labtam 3000

	Poor	Fair	Good	Excellent
Setup	☐	☐	☑	☐
Ease of Use	☐	☐	☑	☐
Performance	☐	☐	☐	☑
Documentation	☐	☑	☐	☐
Serviceability	☐	☐	☑	☐

Features of unit reviewed.

- 8086 and Z80A microprocessors
- 256K RAM
- Dual 1.2M-bye 8in diskette drive
- Single 800K-byte 5¼in diskette drive
- CP/M-86 operating sysem with full CP/M 2.2 emulator.

Price: $8350 (ex. tax).

Distributor:
Labtam, 43 Malcolm Road, Braeside, Vic. 3195. Tel: (03) 587 1444.

For probably less than a tank full of petrol each week . . .

You could have a macpro MBS-802

The macpro MBS-802 is the complete desktop business system.

COMPRISING:
- 12″ Terminal – Detachable Keyboard & Floppy disk drive unit
- CP/M Operating System
- Terminal has graphic capabilities
- Single disc drive unit with **MASS STORAGE OF 1.29 MILLION CHARACTERS**

OPTIONS:
- Twin disk drive of 2.58 M-byte mass storage
- 10M-byte on hard disk
- 256K-byte main memory upgrade
- MP/M operating system for 2 extra terminals
- Printers: Daisywheel $1,195* or DOTMATRIX $884*
- SOFTWARE: Wide range of application software including: Word Processing, Accounts, Communications, Spread Sheet.

CUSTOMISED SOFTWARE AVAILABLE.

$2995 OR $22 p.w.* (approx.)

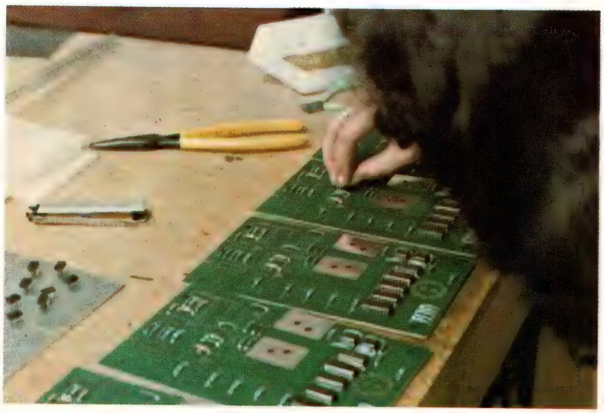
Illustrated is the keyboard, terminal & twin disk unit.

* All prices Quoted Without Tax.
$22 p.w. lease over 4 years
20% residual value, to
approved purchasers.

macpro
COMPUTERS (AUST) Pty Ltd
183 BANK ST., STH. MELBOURNE, VIC. 3205.
TELEPHONE: (03) 699 3100

I am interested in knowing more about the MBS-802 or optional equipment
Name: ....
Address: ....
.... P/code............
Phone:....................

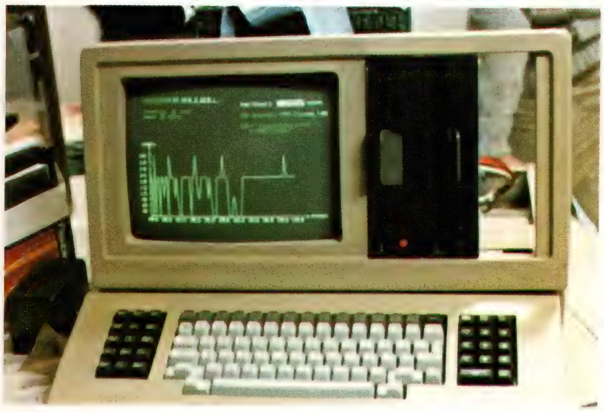
A. MAC/02



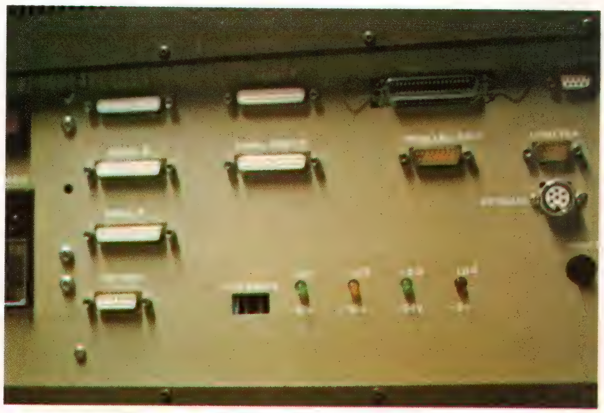
Hand stuffing the circuit boards.

The assembly line.

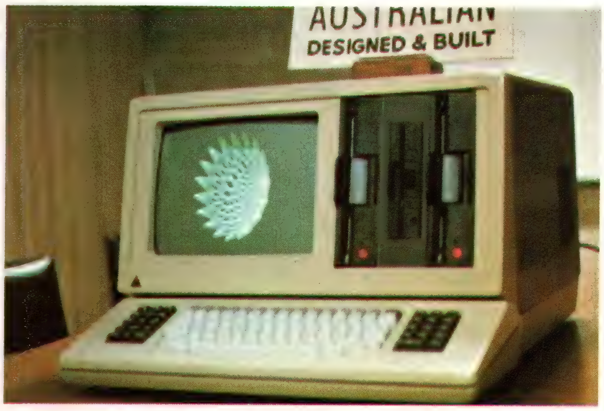
Testing each board before assembly.



Fitting the case.



Ports galore on the backplane.



The Labtam Series 3000.

that a disc be loaded into the A slot and when a suitable CP/M system disc was loaded a 'Ctrl C' brought up a system identity message including revision status and checks of the initial system followed by the familiar A prompt.

Service for the Labtam presents no difficulties as it has been designed for service by the overseas users of the scientific instrument and can be serviced by anybody capable of using a screwdriver.

Comprehensive documentation is provided for the graphics and is provided for the more unusual features of the machine. The description of CP/M and the Emulator are more than adequate for any user already familiar with CP/M.

A CP/M-86 engine without disk system is $5625, excluding tax. Floppy disk drives start at $600. Winchesters start at $1500. Therefore, the cheapest system with 2 x 5¼in floppies would be $6825.

The proposed enhancements indicate potential future directions for Labtam systems. At $8350 (plus tax), for the reviewed model, this all-Australian multi-micro is a challenge to the US 16-bit engines.

The simple fact that it can, and does, successfully run CP/M 2.2 with significant performance improvements should provide the manufacturers with a queue of would-be buyers. How long they have to wait for delivery is a moot point. ☐

Mike Clarke is an independent consultant in Melbourne.

They're growing

With 68000 and Unix, L & L Australia's Unison is a high-performance supermicro. Tony Smith and Mike Clarke describe the birth of a new machine . . .

NESTLING at the foot of Mt Dandenong in Kilsyth is a low-profile brick and smoked-glass plant that looks as if it has come straight from Silicon Valley, California. This is the new home of L & L Australia Pty Ltd.

The showpiece factory produces a range of high-technology devices used in the petroleum supply industry, and the progression from these microprocessor-controlled products to a stand-alone supermicro was the natural direction for the company to take. In October, 1982, the decision to build the Unison, which uses the 68000 microprocessor and Unix operating system, was taken. We visited the factory in July and obtained this preview as production models of the Unison were becoming available.

The choice of the 68000 microprocessor and the Unix operating system puts the Unison in a market where there are very few competitors. The processing power of the 68000 and the Siromath Pty. Ltd-supported Sironix, an enhanced Unix version 7, makes this a front runner against which other 68000 systems will be measured.

The choice of Unix makes the universities, technical schools and high schools obvious customers, as Unix and C are almost universally accepted as excellent computer education and system development tools. L & L's record in the petroleum industry will obviously give it a vertical market with applications packages available for filling stations and bulk-fuel depots.

The entry of Unison in the general small-business area will depend upon how quickly software houses are able to write or convert general-business applications to the Unix environment. Unison, with a large C library, and the Berkley enhancements together with a word processor and database manager, will assist this transition for software houses.

The Unison computer is a floor-mounted cabinet with 10 or 21-slot proprietory bus motherboard, physically complying with the Eurocard standard. It has the usual selection of IMI Winchesters (10, 20, 40, 80Mb), 8in floppy disk drives and streamer tape drives, with a SMD interface to large capacity disks available soon.

The minimum configuration model (D-10) gives three 9600 baud RS232C serial and one Centronics parallel interface, a 10M-byte Winchester, a 1.2M-byte 8in floppy, 2 x 128K RAM boards and leaves four slots spare for enhancements. Together with a Unison 900 series video terminal (based on a customised Mitac unit, similar to a Televideo 950), and Unix run-time licence and the buyer's choice of C, Pascal or Fortran 77, this gives a powerful system for between $14,000 and $15,000 excluding applications software.

The highly regarded Toshiba P1350 dual-mode printer is recommended by L & L. Cobol, Silicon Software's DEC-like Basic and the Unify database management system area also available.

The 68000 runs at 8Mhz and provides a virtual memory addressing space of 16M-bytes for each process. The memory of 128K-bytes to 2M-bytes in 128K-byte increments should satisfy even large installations, but

A marriage of idealism with the realities of the market

IN the short history of the Australian microcomputer industry, the contribution of Unison is a lot more than that of just another MC68000 machine. It is a contribution of anticipation, purpose and a necessary slide from idealism into pragmatism.

The initial conception of Unison was simple enough, a strong multiuser implementation of the first announced processor with 32-bit internal data paths. If it had been possible to turn that initial design into a production system without the delaying factors demanded by the Australian economic system, even Lionel Singer might not have heard of Wicat.

The first conception of Unison was a machine able to compete in world markets. As time went by and national private and government backers found insurmountable obstacles, the emphasis drifted back to import replacement. It was already obvious many US companies would build comparable 68000-based systems and that some of them would reach Australia.

In the climate of the University of Melbourne computer science department, where Unison designer Bill Hollier was doing some contract work, Unix reigned supreme. The perceived need was for an economical work horse computer on which developers with specific application software and hardware projects could build.

Hollier's concept became one of an Australian industry developing in Unison rather than in competition, so it would produce a product with many options that could stand up in the world market on the basis of what you could do with it, if not for its underlying architecture. Although the people involved would never have thought of it in those terms, what they were really looking for was a repetition of the Apple II phenomenon at a very different level.

Unison was kept out of public view for more than a year after its conception.

in Unison

512K-byte boards are due to be available soon.

The specially designed motherboard and bus for use in high-electrical-noise environments reduces the flexibility of the computer, but the availability of a prototype PCB with bus buffering, interrupt logic and DMA space will allow OEM expansion. A multibus adapter is on the drawing board for later release. The switch mode power supply is similarly designed to eliminate electrical noise and is available in three power ratings.

The cabinet is ventilated by a silent fan and stands just less than desk height. This makes the floppy disk and cartridge tape rather awkward to access by office staff. The terminals are supplied by Unison 900 standard green screen VDU's. The system performs well and with five development users on the system when we tried it, gave acceptable responses to Unix commands like EDIT and SORT.

The Unison is obviously aimed at the small mini market place. Its performance should help it to achieve entry. The availability of applications packages and general-business software will determine how long it takes to get off the ground. The 16-bit CP/M-based micros will have an automatic advantage given by the vast number of CP/M applications and may prove to be serious competition when multi-user applications become available. If the Unison can capture its vertical markets before the CP/M machines, its future should be assured.

The concept

THE Unison computer was designed by a small Melbourne-based electronics development company, Information Mechanics Incorporated Pty Ltd, whose principal, Bill Hollier, worked with the Department of Computer Science at the University of Melbourne. L & L Australia has bought the exclusive manufacturing rights for Australia and New Zealand of the Unison computer.

Under the terms of the agreement with IMI a special licence may be issued to tertiary and government research institutions entitling them to build Unison computers for their own use with documentation supplied by IMI, or buy machines from L & L.

This allows these institutions to buy a powerful computing system at minimum price. All general purpose bus compatible boards designed by licensees become part of the Unison product family, thereby becoming available for use by other licensees and for manufacture by L & L.

This means those who participate in the Unison concept are prepared to make a specific public commitment to Australian high technology in a practical and beneficial way.

This approach to licensing Unison means the design capability for all the essential aspects of Unison resides locally and does not depend on overseas suppliers. Thus the Unison machines will evolve in response to local requirements, and the local design capability will provide the basis of an Australian infrastructure. — the concept "working in unison".

The Unison concept ensures many research institutions around Australia are feeding their hardware and software developments into the family, to the mutual benefit of all. The parallel is drawn with the educational licence available for Unix from AT&T, which has immeasureably enhanced Unix.

Because of the breakdown of negotiations with the supposed corporate and government backers and later prototyping at Hollier's private company's own expense, the lid was kept on tightly. Hollier had seen the adverse effects of premature expectations and band wagon jumpers and was avoiding those risks at all costs.

But if you knew someone who had a friend in computer science and you were seriously interested in getting a multiuser Unix system as cheaply as possible, you might have got a whisper of an Australian system that would be available for a few thousand dollars within a few months. That was about the middle of last year, just after the US NCC which had suddenly brought Unix and serious use of micros to the forefront.

L and L had already been identified as a likely manufacturer of Unison when Hollier finally brought the existence of the machine into public view at a Unix users group meeting. That first exposure and viewing of the processor board was in part aimed at accelerating negotiations with L and L.

By then Hollier's Unison concept, as distinct from the machine, was to prove a major issue in the protracted negotiations. He was making sure the licensing agreement would facilitate that concept rather than seeking greater financial recompense for his company.

The involvement of L and L parent, Email, in the latter stages of the negotiations finally swung the balance, as its representatives recognised some worth in tiered pricing and sub-licensing to help Unison realise its true potential.

Email also took what might have appeared to be a charitable initiative in offering Hollier's group a full dealership, an offer that was in reality based on the pragmatism of enabling that group to process all the inquiries it had already attracted without waiting for a national marketing organisation to be put into place.

By the time the formal agreement was signed, L and L had accepted the Unison concept well enough to have made the product a key feature of the opening of its new premises, negotiated Victorian government financial support for its manufacturing program and started production runs of several of the boards required for pre-release and development machines.

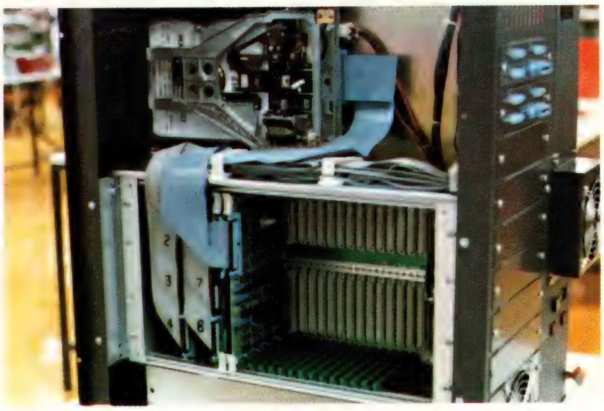
In January this year L and L was happy to recite the Unison concept as part of publicity distributed documentation on Unison manufacturing. But since then, the developing Unison computer has been portrayed increasingly as entirely a product of L and L.

L & L's "silicon valley" headquarters.

Part of the assembly line.

Stuffing chips into circuit boards.

A testing station for completed boards.



The Unison chassis.

Fitting boards into the Unison.

Unisons roll off the production line.

From design to product — Australian made.

Unison's designer

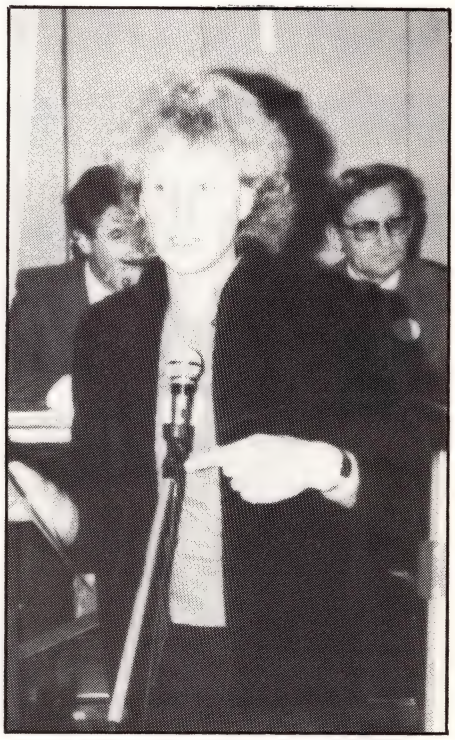
WHEN almost any computer designer is asked the reason for having developed his particular computer, his answer will be in terms of potential market — its perceived appeal to other people. Behind such claims there is typically some personal motivation for the designer to develop a particular application for himself.

Bill Hollier claims the key to best hardware design is in viewing the planned product from the perspective of the person who would be using it to develop software. In the case of Unison, it appears Hollier already had in the back of his mind a project to develop a truly Australian operating system on it, in spite of all the Unix de facto standard hype used in promoting the project.

While still waiting to receive the Unison due to him out of the first production batch, Hollier has committed himself to the development of such an original operating system. He has shifted his base out of suburbia to a modest retreat at the Otways, from where he is frequently commuting for contact with the industry.

Hollier's new operating system will involve a synthesis of concepts behind several proven modern systems such as Forth and Smalltalk into a complete machine-independent, networked product. The philosophy behind the operating system design is closely linked with his view of the emerging technological base on which the society of the future will be built.

The key element is the von Neumann concept of generative systems, machines or software which can produce identical copies of themselves for application in such exotic areas as space-based factories. □



Bill Hollier explains a point

Sendata
300 Modem
Direct Connect

A new direct 300 bps modem that is no taller than a 50c piece and fits snugly under the base of a telephone, has been released by Australian communications modem manufacturer, Electromed.

Called the Sendata 300, the modem is simple to operate and does not require operator training. It plugs into a telephone wall socket plug and becomes fully operational with the flick of a switch by the operator.

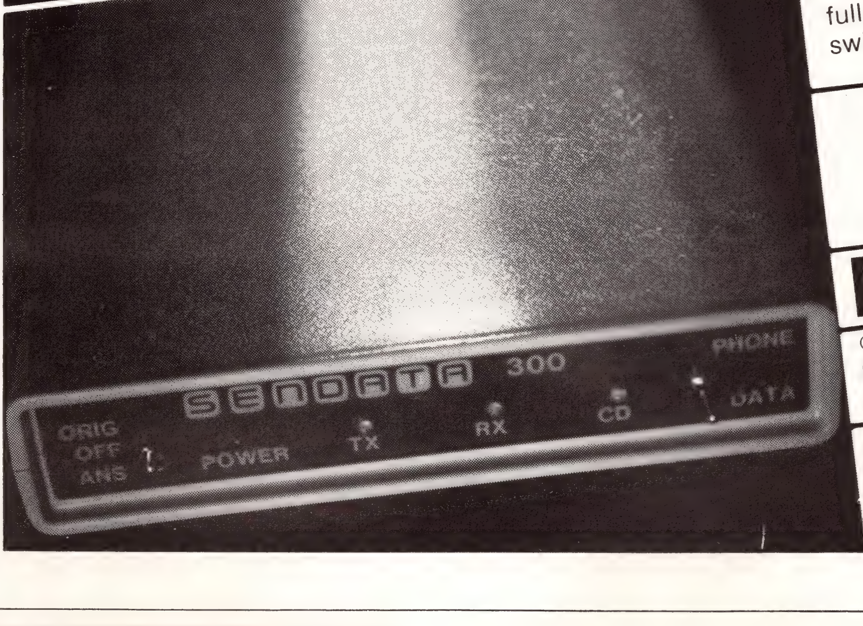
- Full duplex.
- Simple operation.
- Fits under telephone base.
- Telecom approved.

SENDATA

OEM AND DEALER ENQUIRIES WELCOME

ELECTRO·MED
ELECTRO-MEDICAL ENGINEERING P/L

69 SUTHERLAND ROAD, ARMADALE,
VICTORIA 3143, AUSTRALIA
TELEPHONE: (03) 509 5844.
TELEX: AA34008



Enter K021 on Enquiry Card

Why buy seven computers when one will do?

The MPU-700, the fastest and most flexible multi-processor available in Australia today.

What is a multi-processor?

To a computer expert:

It means several users can each plug their own computer (processor card) into a central unit that shares its disk storage and printers without slowing the system down.

To a disillusioned P.C. buyer:

It offers a way of removing the information bottleneck at a single-system keyboard. It will run all his existing CP/M software and files.

To a manager of profits:

It means a cost-effective solution to the computing needs of a small to medium business. A single user system costs $10,000 complete, and the price to add extra users is only $3,600 each.

SME Systems Pty. Ltd., has been designing and building computers for nearly 7 years. The company provides special systems and software to meet your unique needs.

The MPU-700, the latest addition to SME's Unicorn range of single and multi-user systems, has significant advantages over networking and other conventional multi-user approaches.

The MPU-700 basic systems offers:

• 20 M-byte hard disk and 1.6 M-byte floppy disk storage. • Terminal and 200cps printer. • Optional expansion up to 7 users, disk storage to 512 M'bytes, and up to 4 printers. • Other options include graphics and CAD/CAM capability (mono and full colour). • A mix of 8 and 16-bit processors, running under CP/M 2.2 and 3.0, and CP/M 86 operating systems. • Proven Accounting, Word Processing, DataBase and Manufacturing software packages.

SME SYSTEMS

SME SYSTEMS PTY. LTD.
Incorporated in Victoria
22 QUEEN STREET
MITCHAM, VICTORIA
AUSTRALIA, 3132.
PHONE: (03) 874 3666.
TELEX: AA 37213.

DEALER ENQUIRIES WELCOME.

Advance Australia

For a brochure phone us or mail this coupon.

Mail to: SME SYSTEMS 22 Queen St. Mitcham 3132

I am interested in the following:

☐ MPU-700 brochure ☐ Demonstration

Name

Company

Position

Address

Phone

SME 587

Enter K035 on Enquiry Card

Seminar puts industry in true perspective

A seminar in Victoria recently brought together a wide cross section of people from the computer industry. Tony Smith discusses the seminar's aims and achievements.

AN extraordinary seminar in August brought together the largest-ever gathering of people dedicated to the advancement of Australia's computer manufacturing industry.

The seminar, Marketing Native Technology, was held in the Victorian coastal town of Lorne. It was sponsored by the Australian Foundation for Computer Literacy Ltd and funded by grants from the Victorian Department of Economic Development and the Federal Department of Science and Technology.

The seminar was the foundation's first major public activity and was praised by all participants. Industry figures involved in the presentation of the seminar included:

- Lionel Singer, managing director of Wicat Computer of Australia, who gave the first keynote address.
- Rudi Hoess, managing director of Electronic Concepts Pty Ltd.
- Karl Reed, senior lecturer at the RMIT Department of Computer Science and consulting editor of Computerworld.
- Bill Hollier, designer of the Unison supermicro, which is about to be released by L & L Australia Pty Ltd.

Three of the working groups discussed marketing to specific targets — manufacturing industry, government and the Middle and Far East. Other working group topics were:

- Alternative media which emphasised short sales videos.
- Product launch functions which worked within modest parameters of market scope and penetration.
- Presenting a company to potential financial backers.
- Designing the most marketable Australian computer product, which has already produced a new company aiming to develop the chosen product.

There was general agreement on the need for hardware and software developers to get together during the product design phase.

The need for companies to join and support appropriate industry associations was stressed as the most effective means of presenting ideas to Government. Self-regulation, in the form of certification of Australian products as meeting acceptable standards, was supported.

While some of those attending would have preferred to hear success stories from Australian manufacturers, the wider experience of the speakers put the industry in truer perspective. The companies attending should not expect their Australian origins to be an obstacle. Companies that will succeed need to achieve competitive standards of marketing, management and design — objectives, the seminar must have assisted. ☐

An informal gathering at the Marketing Native Technology seminar.

LEARN TO USE A BUSINESS COMPUTER

PROFESSIONAL PROGRAMMING part-time: $5000 — 5 months plus 6 months support
- We presume you work 9-5, so our hours fit your needs, and you pay as you go!
- Big companies: Train your experienced, loyal staff — they understand your business and will stay!

WORD PROCESSING: $150
- Learn to modify text layout. Move/delete paragraphs, pages.
- Create standard "personal" letters and address labels.
- Use automatic spelling checker.

SUPERCALC/VISICALC/LOTUS: $150
- Replaces periodic forms and calculators.
- Performs automatic maths functions on columns of figures.

USING GEN' LEGDER, DEBTORS, CREDITORS: $250
- Learn to do these jobs on a computer.
- Learn the accounting theory involved.

TOUCH TYPING: $80.
- Learn to find the keys faster.

PROGRAMMING — business systems: $400
- Understand/evaluate programmers.
- Acquire new skills, perhaps a new job.

ACCOUNTANCY SYSTEMS: $400
- Theory and practical work on manual and computerised General Ledger, Debtors, Creditors, etc.

COMPUTERISING AN OFFICE: $400
- Detraumatise the selection and installation of the computer, programs and staff.
- Using Word Processors, Supercalc, DBasell, networking.

MICRO WORKSHOP
SYDNEY: (02) 235 0502, (02) 235 0937
Floor 1, 175 Pitt Street.
WOLLONGONG: (042) 83 5133
BRISBANE: (07) 221 8666
PARRAMATTA — site and staff required.

Enter K026 on Enquiry Card

INFORMATION BUSINESS MANAGER

A COMPLETE BUSINESS SYSTEM

- ★ **2.6 MEGABYTES** OF DISK STORAGE (HARD DISK OPTIONAL)
- ★ Z80A 64K CPU EXPANDABLE TO **832K**
- ★ 80 x 24 GREEN SCREEN TERMINAL WITH DETACHABLE KEYBOARD
- ★ CP/M 2.2
- ★ REAL TIME CLOCK
- ★ EXPANDABLE TO **4 USERS**
- ★ AUSTRALIAN DESIGN, LOCAL SUPPORT AND SERVICE
- ★ **12 MONTHS WARRANTY**

FREE

FULLY INEGRATED ACCOUNTING SYSTEM including:

- ★ DEBTORS
- ★ CREDITORS
- ★ STOCK CONTROL WITH INVOICING
- ★ GENERAL LEDGER

$3995.00
(including tax)

DEALER ENQUIRIES WELCOME

A & M COMPUTER SOLUTIONS PTY. LTD.
(Incorporated in Victoria)
353 BURWOOD ROAD, HAWTHORN 3122
TELEPHONE (03) 818 0595

Enter K020 on Enquiry Card

Must COMPUTER CORP.

Executive 816
Portable Briefcase Computer

Believe what you see!

AMust COMPUTER CORP.

Executive 816
Portable Briefcase Computer

Executive 816
Portable Briefcase Computer

SPECIFICATIONS

- ★ Z80A CPU, 64K memory
- ★ CP/M 2.2 operating system
- ★ 1.6 mbyte floppy disk capacity
- ★ Optional 2.4 mbyte floppy disk capacity
- ★ RS-232 communications port
- ★ Centronics printer port
- ★ Connection for dual 8″ FDD
- ★ Connection for 10 mbyte Hard Disk
- ★ Built-in 5″ 80 x 24 character CRT
- ★ Connection for external 12″ CRT
- ★ 110 volt/240 volt AC operation
- ★ 50 Hz or 60 Hz operation
- ★ 12 volt car battery operation (optional)
- ★ Serial keyboard
- ★ 5 function keys, numeric pad
- ★ Cursor keys
- ★ AMUST "mouse" capability (optional)
- ★ Acoustic modem capability.

POWER REQUIREMENTS

★ 220 V 50/60 Hz:	• .2A, 50 W typical • .3A, 80 W typical
★ 110 V 50/60 Hz:	• .4A, 50 W typical • .6A, 80 W typical
★ 12 V DC	• 4.4A, 55 W typical • 6.4A, 77 W maximum

RETAIL $2995 plus Sales Tax

SOFTWARE

The Executive 816 **includes** ready-to-run, powerful business software designed for easy use.

IMS ACCOUNTING

PROJECT COSTING

MEMBERSHIP SYSTEM

WORD PROCESSING

COMMUNICATE

DATABASE

GOBANG & COMPANY

OCAS

CASH FLOW

SPECIAL SOFTWARE OPTIONS

Manufactured for Australia
and New Zealand by

AMUST COMPUTER CORP.

350 South Road, Moorabbin 3189 Telephone 555 3644

Victoria
Compak Computer Centre
350 South Road, Moorabbin 3189
Telephone (03) 555 9844

A.C.T.
Microbee Computers
Cooleman Court, Weston 2611
Telephone (062) 88 6384

New South Wales
President Computers Pty Ltd
Rear 100 George Street,
Hornsby NSW 2077.
Tel. (02) 476 2700. Telex: 25427

South Australia
Elmeasco
G.P.O. Box 1240, Adelaide, 5001
Telephone (08) 271 1839. Telex: 88160.

Western Australia and Northern Territory
Micro Base
422 Newcastle Street, West Perth 6005
Telephone (09) 328 5838

Enter K055 on Enquiry Card

Processing Words

Microcomputer-based machines have provided an opportunity to explore the development of machines for the personal creation and production of the printed word and the replacement of the printed word with the electronic word.

APPLE's Lisa is a revelation to anyone used to the tyranny of characters over most word processors. The bringing to market of integrated data management environments, the development of data display VLSI chips and especially the re-emergence of the personal dimension of microcomputing with notebook portables, will encourage the development of packages that support the casual and adhoc aspects of personal information systems.

Processing alphabetic symbols has been a demonstration of the computer's capacity to do more than crunch numbers. Approaches to the design problems associated with processing words have been dominated by the creation of environments for people writing texts for computers or people involved in the formalised production of printed documents, usually in the commercial environment.

The development of computer systems based on the microprocessor has prompted the development of systems that are intended to be integrated into personal information systems. These programs have explored ways of moving from character orientated approaches to systems that are appropriate to the ways that people organise and use the written and printed word. Progress has been slow.

Ted Nelson's famous quote "the ability to make marginal notes is the trivial requirement for a word-processing program" suggests that word-processing programs are a good measure of the quality of the computer environments that are available for our use.

Eleven word-processing programs for CP/M and MS-DOS environments and at least 18 machine-specific packages are available in Australia.

Due to the size of our feature on the Australian microcomputer manufacturing industry, this *Product Spotlight* does not include a survey of these packages. This will be published early next year.

The Logic Shop
Personal & Business Computer Systems
Presents
Epson RX-80

The new Epson RX-80 dot matrix printer, featuring 8KB ROM, uses proven EPSON MX series technology combined with several new features to take the lead in moderately priced printing. Ideal for both business and personal computing use, the RX-80 guarantees the same reliability and versatility that has made the EPSON MX series the world's best selling printers.

The Logic Shop
Zagon Computing Pty Ltd
97 Franklin Street, Melbourne.
348 1488

Special Price
$585.00
+ Tax ($117.00)
Includes 12 months Warranty

Enter K082 on Enquiry Card

Lazy Writer offers a big boost to creativity

For business letters or for creative writing, program design is vital. Clifford S. Richards describes a flexible processor of words for the TRS-80.

IN this electronic world, the weary typist retyping her letters and the harried novelist filling wastepaper baskets with half-empty sheets of paper are no more. Text can be corrected before anything is put on to paper.

For the typist and writer, many poorly designed and mediocre programs are marketed.

As an avid word-processor user, I have studied many of these programs. Lazy Writer is my first choice. It is a superb program containing many features, some of which are found in no other programs.

The drawback is that it only runs on the TRS-80, not on Apple, the IBM or Osborne, but it will be coming soon on CP/M computers.

I had tried my hand at writing many times, but always quit frustrated, ankle deep in crumpled paper. Ideas always vanished so quickly that I could not capture them.

Editing, for me, is usually a complete reconstruction — deleting, combining, adding, rewriting and moving. Lazy Writer makes it simple, pleasant work.

Lazy Writer features unique programmable keys. As an example, to delete a word and replace it with another word or words, the steps would be:

1. Type d to delete mode.
2. Type a space to delete a word.
3. Type ENTER to go back into Edit.
4. Type capital I for insert.

A single key can be programmed to carry out this sequence of operations. Thus, anything that needs to be done, takes one keystroke. Any number of programmed keys can be saved on disk in batches of ten to be available as needed.

Typing "C" in Edit mode will cause any "i" with a space on each side, and letter after a full stop and space, to jump to upper case. Use "c" and the letter under the cursor changes to capital. If it was a capital, back to lower case.

In Lazy Writer, searches can be case-independent. Each replacement can be queried or all replaced without reference.

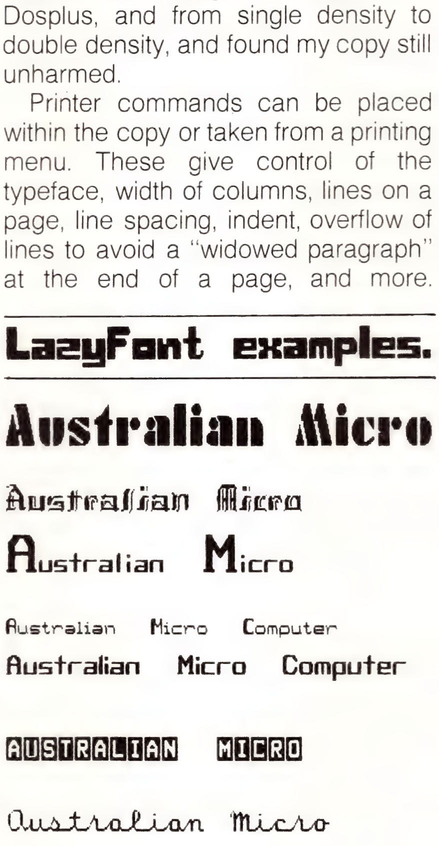
Typing "M" in Edit, puts an invisible mark on your copy. Small "m" remembers where you were and takes you back. You can refer to disk files without disturbing current work. And Lazy Writer remembers the name of the current file.

Bracket a block, word, sentence and move it anywhere. Name several blocks and call them up by name.

You can Return to DOS without losing copy. If you do not go into Basic or copy a disk, it will be there when you return. I have changed from Newdos to Dosplus, and from single density to double density, and found my copy still unharmed.

Printer commands can be placed within the copy or taken from a printing menu. These give control of the typeface, width of columns, lines on a page, line spacing, indent, overflow of lines to avoid a "widowed paragraph" at the end of a page, and more.

LazyFont examples.



Australian Micro

Australian Micro

Australian Micro

Australian Micro Computer

Australian Micro Computer

AUSTRALIAN MICRO

Australian Micro

Headers, footers and page numbering are simple. Individual names can be automatically inserted into letters.

FORMATTER reads printer commands from the copy or menu. It shows the number of actual words, pages, and where the breaks occur. If there has been an error in a printer command, FORMATTER indicates ERROR and returns to the copy with the cursor marking the mistake.

FORMATTER also hyphenates. Declare the number of letters acceptable and each word will be shown in its context. This allows the opportunity to hyphen it at the best place.

The dictionary is the Electric Webster from Cornucopia. It has a 50,000-word vocabulary. Further words may be added as required. It compares each word in the text with the dictionary and lists "unique" words in a few seconds on the VDU or printer.

Each word is displayed with a menu giving the options of entering correctly, or searching and displaying the dictionary. It will correct, display a word in context, or leave it as is. This is all done inside Lazy Writer. The Electric Webster can also correct syntax.

Type "H" in Edit and a Help file comes to the screen. This, can be altered to your needs, and use will diminish as you learn the program.

With the extension CHANGELW, Lazy Writer can be customised — tabs set, shape of the cursor, speed at which the cursor blinks and the arrows move through the copy, and more.

Yet another extension alters the printer driver program to suit your printer and yourself. Down linefeeds, software formfeed, parallel or serial interface, backspacing, either by special code or two pass can be set from PRINTGEN.

Files can be killed or compared from within the program. Any ASCII file including Basic can be loaded or saved.

Despite all these features, the program only takes about 12K of memory. Files can be, nevertheless, changed for the printer. It could handle a book as large as *Gone with the Wind* and automatically number every page.

An extension called LAZYFONT is unique. This enables the Epson MX80 to print from disk files in dot graphics. It is simple to use and great for printing letterheads and logos. □

WP into the home

Word processing has been out of reach of the average Apple II home micro user. But Ed Burnstein expects the Bank Street Writer program to change that.

FOR a relatively small investment, Bank Street Writer provides nearly everything most households need to write letters, draft reports, even do homework. It's also a simple-to-learn, remarkably well-documented little gem of a program that may spell an untimely death for many a typewriter.

The program, designed at New York's Bank Street College of Education and distributed by Broderbund Software, was tested by a panel of more than 100 college students before its release for Apple.

The program is geared for users who have never operated a word-processing system or even a computer.

The program reduces all word-processing activity to one of three modes — Write, Edit or Transfer. After you boot the disk, the screen displays a text "window" with room for 18 lines of type, each 38 characters long.

Meanwhile, at the top of the screen, above the outlined text window, appears the menu that corresponds to the Write mode. The program reminds the user that he can use the left and right arrows to erase text.It also reminds the user that pressing Shift-N once capitalises the next letter typed. Pressing the Shift-N twice is the same as pressing the Shift-lock key, and you get all capital letters.

At this point, the Bank Street Writer operates as a word-processing program. Words that extend beyond the right margin of the text are automatically "wrapped" onto the next line. The text automatically scrolls up eight lines when the bottom line of the text window is reached.

Next stop for most writers would be the Edit mode, which you enter by pressing the Escape key once. The text window remains the same, but the menu above it changes to provide a new set of options for altering text or moving the cursor. Simplicity — if not always speed — remains the key. At this point you can erase or move text. The process is slower than in other systems, but — conveniently and reassuringly for inexperienced users — you can always recover from inadvertent erasures or moves by using the Unerase or Moveback menu option in the Edit mode, either of which puts you right back where you started.

In the Edit mode, you can use a Search-and-Replace function to find certain words or phrases in the text and replace them with others.

The third mode provides transfer operations — in short, anything involving communicating with the disk drive or the printer. As in the Edit mode, you use the left and right-arrow keys to choose among the options.

The disk options allow you to save files to the disk, complete with password for security; retrieve them from the disk; and delete or rename them. You can also initialise a new disk.

There are two printing options, Draft, which prints the text just as it appears in the 38-column, single-spaced text window and Final, which asks a series of questions regarding how you want the printed version to look.

The program is designed to operate with a single disk drive. Therefore, the entire program is loaded into memory when you start so that you can replace the program disk with a data disk. This means the program takes up a large portion of memory. As a result it limits each file to about 1300 words in a 48K system or 3200 words with a 16K RAM card or Apple Language Card.

The only serious drawback lies in its lack of speed. In particular, switching modes and erasing or moving blocks of text is slow and a bit awkward.

You get two approaches to documentation with the Bank Street Writer, both excellent. One is the on-screen tutorial, available on the flip-side of the double-sided program disk.

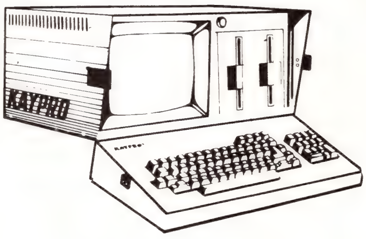
The other is a 28-page manual that is among the best pieces of documentation I've seen for inexperienced computer users. ☐

JUPITER MICRO CRAFT
MICRO COMPUTER SYSTEMS
AND SOFTWARE (Since 1979)

Suppliers of:
Apple, Basis Medfly,
Morrow Micro Decision,
Access Portable,
Pericomp Pied Piper,
Discovery Multiprocessor
Custom Programming for CP/M and Apple.
Specialists in:
Small Business Accounting/
Inventory, Order Processing
Billing/Accounting systems for
Milk Vendors and Newsagents.
Installation, Training and Support second to none.

SIMPLY THE BEST
Telephone: (09) 450 5954
37 Ley Street, COMO 6152.
Western Australia

Enter K077 on Enquiry Card

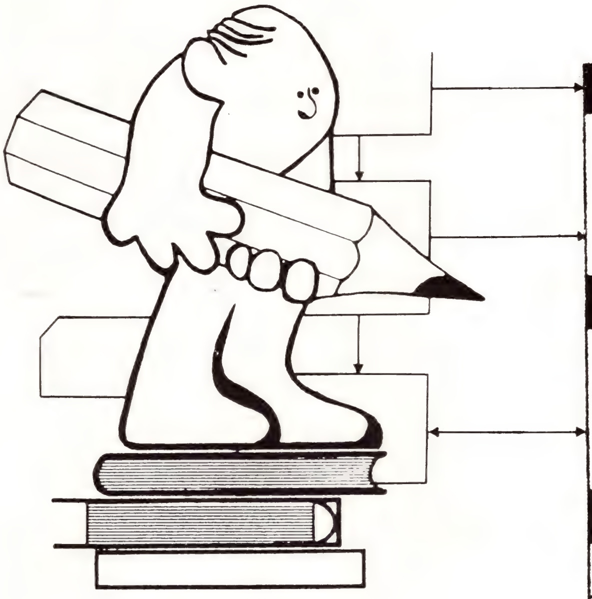


KAYPRO II B
Now available with
800Kb per Drive!!!
MICRO EDP can supply a modified KAYPRO II B with four times the disk drive capacity. Requires disk drive replacement and modified Bio's and utilities.
Complete new machine $3999, inc. Sales Tax.
Upgrade $800 including Sales Tax.

APPLE II USERS
8" DISK DRIVES!!!
1.2Mb per drive
DOS 3.3, CP/M and PASCAL cased drives, power supply cable and controller.
Patches for each operating system included.
$2499 including Sales Tax.

MICRO EDP & HARDWARE
9A-1 Leura Ave, Claremont
Western Australia 6010
Telephone: (09) 384 5511

Enter K078 on Enquiry Card



WORD PROCESSORS, MICROS, AND WRITERS

By David Moody

David Moody offers a writer's view of the current word-processing scene, some of its history, and how it might change. If you are a writer currently looking at word processors, read on . . . this article is written specially for you.

THERE can be little doubt that the microcomputer is set to take the lion's share of the word-processing market within the next few years. I say this because of the gigantic mountain of software already written, and the enormous development activity associated with the micro everywhere in the world.

Although not ideally fitting the requirements of writers, the currently available word processing software for microcomputers is streets ahead of anything that was around 15 years ago.

In my work as a professional writer/editor, I have produced somewhat over 10,000 pages of copy, most of it using automation of one form or another. Paper-tape typewriters, card punches, teletypes, computer systems of all shapes and sizes (Control Data, IBM, Texas Instruments, HP, Intertec, nec, etc.), line printers, matrix printers, magnetic tape interfaces to typesetting or reprographic systems (e.g., Xerox 9700, III VideoComp), have all been used by me with the only objective creating and printing copy.

When people talk of "word processing" these days, my eyes usually glaze. The reason behind my feeling thus is that the term has become identified with word-processing operators, secretaries and typists, and not with the writer at all.

As far as I'm concerned as a writer, the *only* benefit of using word processors is that the acts of creation and production are merged, all at the one desk. Without this merging, there are no benefits to the writer that I can see, (although there may be to other people involved in the production chain). You might just as well hammer out copy on your old trusty portable, write it long hand, or use what can be a very effective "word processor" — the office photocopier!

Apart from programs I have written myself, the best word-processing software I have used was an in-house program used in Texas Instruments, called PLAP. Not surprisingly, this was written by a technical writer. In conjunction with the flexible TI 990 operating sysem, SCI and a disc file management program called DFM, the system was easy to use by technical writers and engineers alike.

For a microcomputer word-processing program to be any good, it must be written for a microcomputer that is best suited to the application. It must have plenty of memory (256K-bytes or more), sufficient and reliable disk storage (8in disks are better than the 5in ones), a full-sized and friendly keyboard, and good character graphics that can be displayed and printed.

The program itself must be designed to allow you as much flexibility for creative keyboarding as possible (hopefully as much or more than your old trusty portable!), and be friendly and reliable in use.

Assuming you are of normal intelligence, it should not be "menu driven" so that you are locked into doing things in specific orders or compartments. Menus might seem a good idea to start with, but always become tedious and constricting shortly afterwards.

Although a matter of preference, for me a solid keyboard with good functionality (that I use on my lap with my feet on the desk) is absolutely essential. I'm not interested in mice, baskets, voice input and other gimmicks for creative writing. So if you think best when at your typewriter (as I do), bear this in mind if you buy a micro primarily for word processing.

Unless your requirements are so dull as to be completely normal, the program must be supplied to you in its source form, to allow you to change it. The reason I write my own programs is that I am fussy over the tools I use in my work, and if some aspect annoys me, then I can change it.

With searching commands, for example, I have encountered systems that (a) don't allow you to repeatedly search for a word (unless you enter it every time), and (b) get stuck on the word when found.

I could make a long list here of such detailed points, but that would be tedious. Instead, I will generalise by saying that systems designed by DP professionals, rather than writers who use the systems, often fall into making such errors of design.

The overall design of a word-processing program for the writer needs careful consideration. The designer needs to be aware of the stages passed through from copy origination to production. Otherwise the program will not be a good fit, will emphasise the wrong features, and may be awkward to use.

For example, we need simple editing commands, we need easy draft prints and proofing facilities, we need facilities for text and graphics composing. But we can happily live without commands which "detect" paragraphs, sentences and words, or processes which perform algorithmic hyphenation. (Detect is in quotes because no intelligent machine yet exists.)

Although it is common practice for word processors to utilise a mark-up notation to control document format and typography, you should realise the historical reasons for this. Because, with improved technology, it is dying.

I've encountered word processors where the mark-up notation was so thick, that it was near impossible to see the copy (you only had a monocase character set in the early days, so had to mark-up all upper-case letters!)

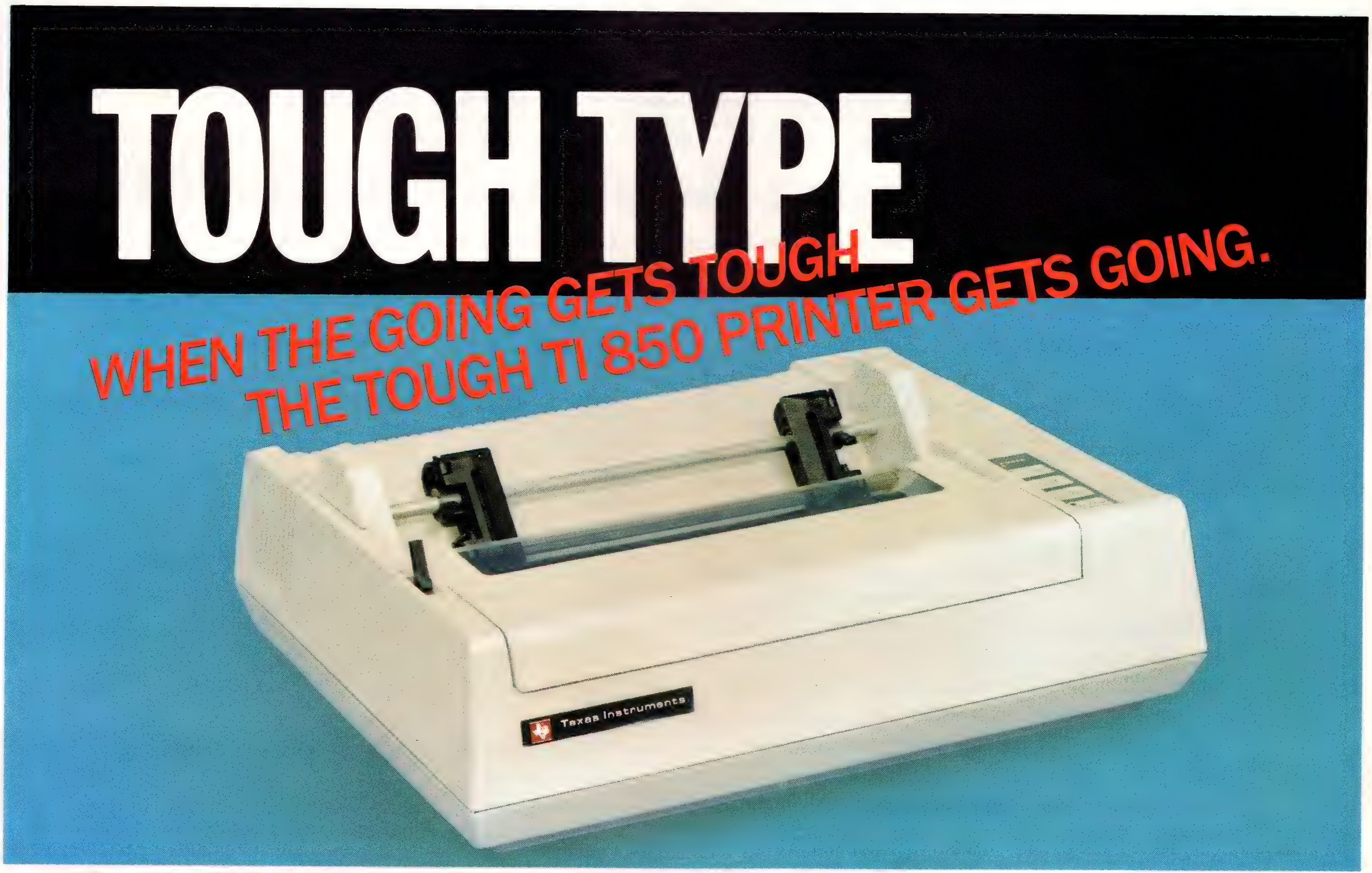
With a microcomputer such as the APC, not only can you have an infinite character set, but you can type, display and print them. So the need for mark-up is reduced, and copy origination and editing are made easier.

An important point related to the above paragraph, is the matrix printer and how it is developing. Starting life as a cheap printing alternative to impact printers, matrix printers are becoming more and more advanced, both in graphics and character printing capabilities — for example, the high resolution printers from NEC and Philips.

The diagram at the beginning of this article was produced on the standard NEC 8-pin matrix printer (PC-8023B-C). This is their low-end matrix printer, so it would be interesting to see the quality achievable using the 30-pin print head being developed.

'OK' is the name of my word-processing software for the NEC Advanced Personal Computer. It consists of three programs: the OK Editor, the OK Word Processor, and the OK Typesetting Interface. The editor is complete and documented. I should have the word processor finished towards the end of this year, and the typesetting interface in the first of 1984.

- *David Moody is a freelance software documentalist and can be contacted at (02) 642 3695.*


TOUGH TYPE
WHEN THE GOING GETS TOUGH
THE TOUGH TI 850 PRINTER GETS GOING.
Texas Instruments

**The brilliant TI 850 Printer is specifically designed as a superior printer for low budget print requirements. It delivers page after page of the toughest printing in the business world.
So it's no tough choice . . . just a tough printer.**

Also distributed by: VSI Electronics (Australia) Pty Ltd. Datatel Pty Ltd. Anderson Digital Equipment Pty Ltd.

TEXAS INSTRUMENTS
SYDNEY (02) 887 1122, MELBOURNE (03) 267 4677

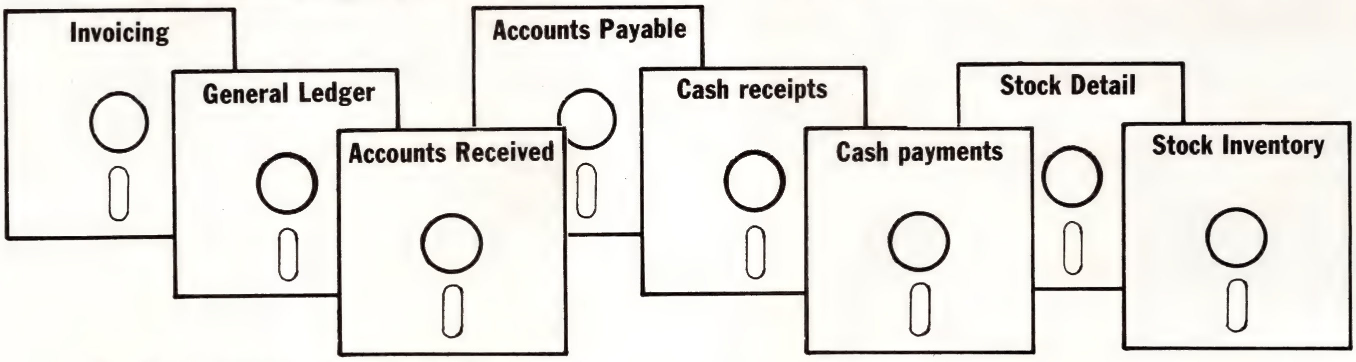
NLS

Non-Linear Systems combines...

KAYPRO

with Davidson Business Software

Includes eight packages that may be used alone or in combination.



The Kaypro-Davidson System is easy to use and requires no special training or skills. Economically priced it ensures that computerised business activities run trouble free. Generous report writing is available with each package.

Kaypro portable computers now come in three models: Kaypro 2/200Kb Disk, Kaypro 4/400Kb Disk, Kaypro 10-10Mb Hard Disk.

This range provides a selection of microcomputers for small and medium-sized businesses.

NLS

Non-Linear Systems (Aust) Pty Ltd
130-136 Miller Street,
West Melbourne, Vic 3003.
Telephone (03) 329 9951. Telex: 34082.
NSW: MTM (02) 661 4944.
QLD: L.E. Boughen (07) 369 12777.
SA: Computer Services (08) 352 7911.

Enter K032 on Enquiry Card

KINETIC SYSTEMS PTY LTD

357 Nicholson Street
North Carlton, Victoria
Tel: (03) 347 7326

29 Cowper Street
Parramatta, New South Wales
Tel: (02) 689 1434

Cromemco™

The amazing C-10 SP.

All CROMEMCO products.

CROMIX O.S. C.DOS. O.S.
Languages

C.A.D. + C.A.M. programs.

Development systems.

C-Net (networking up to 250 C-10 computers)

All S.100 cards conforming to 696 standard available.

Approved for use by N.S.W. Catholic Schools

ICL TRADERPOINT

Personal computers.

DRS 20 family
and all ICL products —
Business systems
Application software.

Government approved.

The amazing Cromemco

C-10 SP inc. for $2549 + S/Tax.

64Kb MEM, 1 x 390Kb D.S.D.D. DRIVE

32Kb BASIC, W/P Package,

Financial Spreadsheet
Money Master.

Ring or write for classroom or business applications for the C-10 SP.

SPECIAL PRICES FOR ALL OUR PRODUCTS FOR EDUCATIONAL USE.

Enter K033 on Enquiry Card

TAA announce the demise of the two-headed, six-handed convention planner with eyes in the back of his head.

It's quite understandable how the brave person who attempts to organise a convention single-handed can feel the need for two heads, six hands and eyes in the back of his head.

But now, thanks to TAA, help has arrived. 'Organising Conventions Successfully'–the first and only comprehensive book on Convention Planning in Australia.

It's written by Kenneth A. Scheller, one of Australia's foremost pioneers of the Convention industry, and Managing Director of his own successful Convention Management company.

This book, available only from TAA, will take you step by step through the planning of your convention – from establishing the purpose and theme, to your closing celebrations. It will show you how to set up a steering committee to estimate attendance, plan your format and overall programme, organise venues and dates, estimate budgets and allocate responsibilities.

'Organising Conventions Successfully' will show you how to organise sessions, the social programme, finance, promotion and public relations, travel and accommodation, exhibitions and recreation.

Who'll take charge of protocol? Registration forms? Distribution of promotional literature and paperwork at the convention? Liaison with speakers?

It's all in the book, which comes with TAA's Convention Planner.

And that's not all you get.

'Everything about your convention that you can't afford to forget'– a checklist that takes the worry out of remembering every little detail. Like organising baby-sitting facilities for your delegates' children. Religious requirements. Vegetarian cuisine. Even entertainment and hospitality for your speaker's spouse. It's all there in the checklist.

'What TAA will do to help ensure that your convention is the most successful ever'– a booklet detailing the many ways TAA can help you plan your convention. By providing assistance for delegates and the committee, financial and printing assistance, domestic and overseas travel, interpreters, insurance and more.

You'll also get a six year planner, plus special deals on Hertz Rent-A-Car.

At TAA, we'll give you all the help needed to make your next convention an outstanding success. So call us today. We've got the knack of making two-headed, six-handed convention planners feel almost human again.

Contact the TAA Convention Travel Manager in your State.

'Our TAA'

Brisbane 33 2011; Sydney 238 4442; Canberra 46 1811; Melbourne 341 3736; Hobart 38 3511; Adelaide 216 1911; Perth 323 0331.

TA0361

Enter K012 on Enquiry Card

It's plain to see the advantages of a faster, more efficient, computer filing system.

- **Now the term "friendly to user" becomes a practical reality.**
- **All good designs are simple and so is the Elfi/PC software.**
- **The new Elfi/PC software package gives you an efficient information retrieval system, on command.**
- **No more wasting time changing from one file to another.**
- **It is easy to set up, easy to understand and very easy to work with.**
- **Up to 9 files of information can be shown on your screen at the one time, enabling you to get a comprehensive information source.**
- **9 screen layouts, 9 report layouts and 9 mailing list layouts are available per file.**
- **The 9 layouts are completely flexible and you can create any format to suit your specific requirement.**

And much, much more!

The Elfi/PC lets you connect a record in one file with as many other records in up to four other files.

For example, you could have a purchase record connected to 4 or 5 service records, as well as several records in the client history file. And, with a push of a function key, you can quickly look at all the connected records, saving you time and effort.

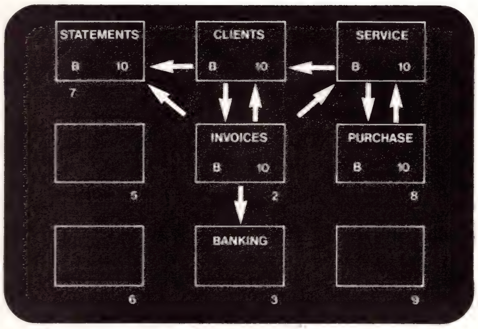
- **Mailing lists are easy and simple to do.**
- **Labels can be sorted by postcode or any of the 10 fields you select.**
- **Naturally, the Elfi/PC can be connected to your word processor!**
- **Requires no programming skills.**
- **Fully supported including a 'Hotline' facility.**

The Elfi/PC is extremely useful in sorting out records for any requirement. It facilitates speedy organisation of, and access to, personnel files, stock inventory, data indexing, financial records, invoicing and billing.

For professionals, businessmen or corporate executives, Elfi/PC can be used to create reference files and archives, as well as filing case histories, client/patient's accounts or even library catalogues.

The Elfi/PC software package for filing systems, designed by a leading IBM consultant, can be utilised by both the IBM/PC and XT under both releases of MS.DOS and works on other IBM compatible equipment.

Wang/PC compatability is currently being prepared and will be released shortly.



Simply by pushing the appropriate function key, you can gain access to files without losing your space or record in the original purchase file, as illustrated here, when you wish to retrieve information on the client history file and the services file.
No longer do you have to get out of the purchase file, go to the menu, then to the next file, and search for the information you need.

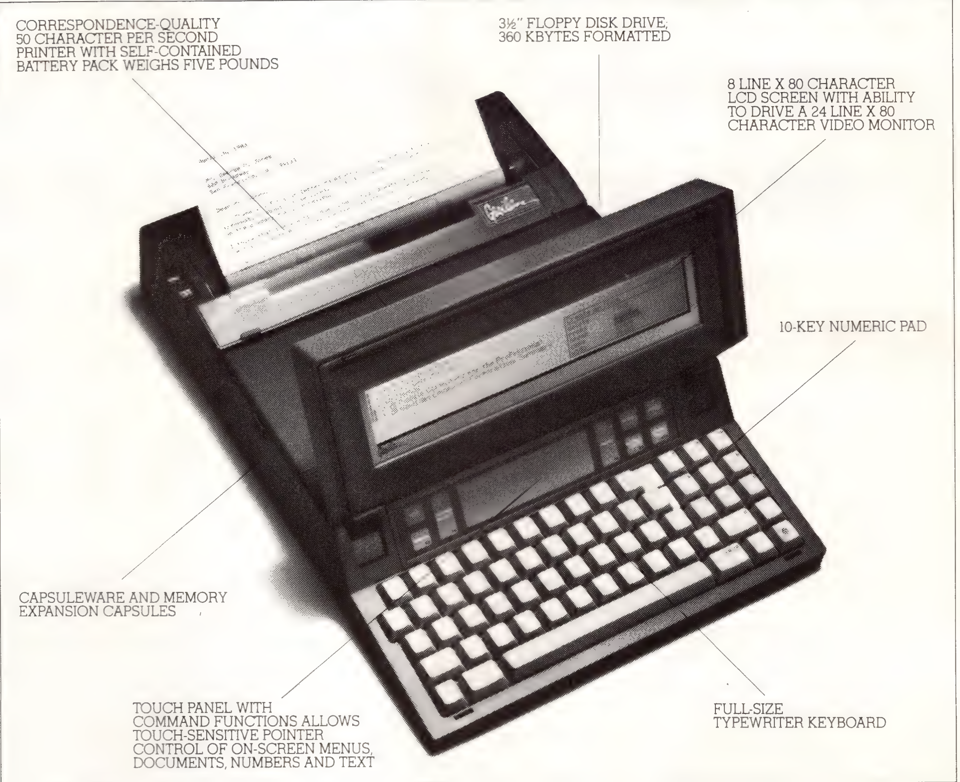
Available from:
Computerland, Bondi Junction
Phone 389 4466
Parity Computer Ltd
Phone 929 0900
City Personal Computers
Phone 922 3600
OR CONTACT US ON
THE ELFI 'HOTLINE' PHONE 267 1707

GPW SOFTWARE OPTIONS

Suite 504, 5th Floor, 127 York Street Sydney 2000, N.S.W.

Enter K053 on Enquiry Card

THIS IS NOT THE MOST AMAZING PART.



By any measure of modern achievement, a nine-pound, 16-bit, battery-powered business computer is quite amazing. The attachment of a five-pound correspondence-quality printer makes it even more so.

The Gavilan mobile computer is the first ultra-portable system designed for complete field automation. It lets professionals on the move type, compute, store, recall and print hundreds of pages of information practically anywhere, without the need for electrical hook-up or external battery packs.

BUT THIS IS.

The key to the Gavilan's success as a stand-alone mobile computer lies below its surface. The Gavilan operating system has made possible two advancements that make it the first completely viable computer for mobile professionals.

The first is its fully integrated software. Yes, fully integrated. Its CapsuleWare™ software programs are contained within storage capsules that plug interchangeably into the computer.

No other microcomputer offers the degree of software integration afforded by the Gavilan shared data format of CapsuleWare.

The complete set of CapsuleWare programs includes CapsuleWord™ word processing, CapsuleCalc™ calculation & analysis, CapsuleOffice™ portable secretary, CapsuleComm™ communications and CapsuleForm™ forms processing.

Secondly, the Gavilan's primary user interface is not the keyboard, but instead, a built-in pressure-sensitive touch panel that not only selects, but executes, commands. With the full capabilities of a mouse, this simple "point and tap" interface all but replaces the keyboard in normal computing operations.

For the end user, the combination of these two features totally eliminates the need to key-in complicated computer commands to enter and exit separate programs, and manipulate menu items or data.

For the value-added OEM, this means being able to establish a totally new market niche with a uniquely competitive product.

LEAVE YOUR COMPETITION BACK IN THE OFFICE.

Suddenly, the practicality of the Gavilan system is creating a demand for vertical market software packages from the widest diversity of mobile professionals ever — from field auditors to field correspondents, sales representatives to service representatives, insurance agents to industrial engineers, architects to anthropologists.

The ability to write and print-out reports and letters, send and receive electronic transmissions, work up a spreadsheet analysis or simply store vast quantities of data in the field is capturing the imaginations of professionals who never before considered a computer a viable working tool away from the office.

SOFTWARE IN A CAPSULE— A POWERFUL NEW INNOVATION REWARDS UNLIMITED DEVELOPMENT OPPORTUNITIES.

The Gavilan mobile computer was built for the broadest range of applications program development. Programs can be written by OEMs or end users. In MS/DOS or Gavilan's own operating environment. On 3½" microfloppy diskettes or CapsuleWare.

So whether you're an end user or an OEM, we've made it amazingly easy for you to take the next step in hardware and software: mobile computing.

Gavilan Computer Corp.
P.O. Box 5004
Campbell, CA USA 95008
Telex 4991278 GVLN US

Gavilan

Gavilan, CapsuleWare, CapsuleWord, CapsuleCalc, CapsuleOffice, CapsuleComm, and CapsuleForm are trademarks of Gavilan Computer Corporation. MS/DOS is a trademark of Microsoft Corporation.

See the Gavilan mobile computer in the Electronic Concepts booth, stand #59, at the Australian Computer Conference on September 26-30, 1983. Or contact Electronic Concepts, 55-57 Wentworth Avenue, Sydney NSW 2000, Australia. Telephone: 212 2833. Telex: 24657.

AB Office Electronics

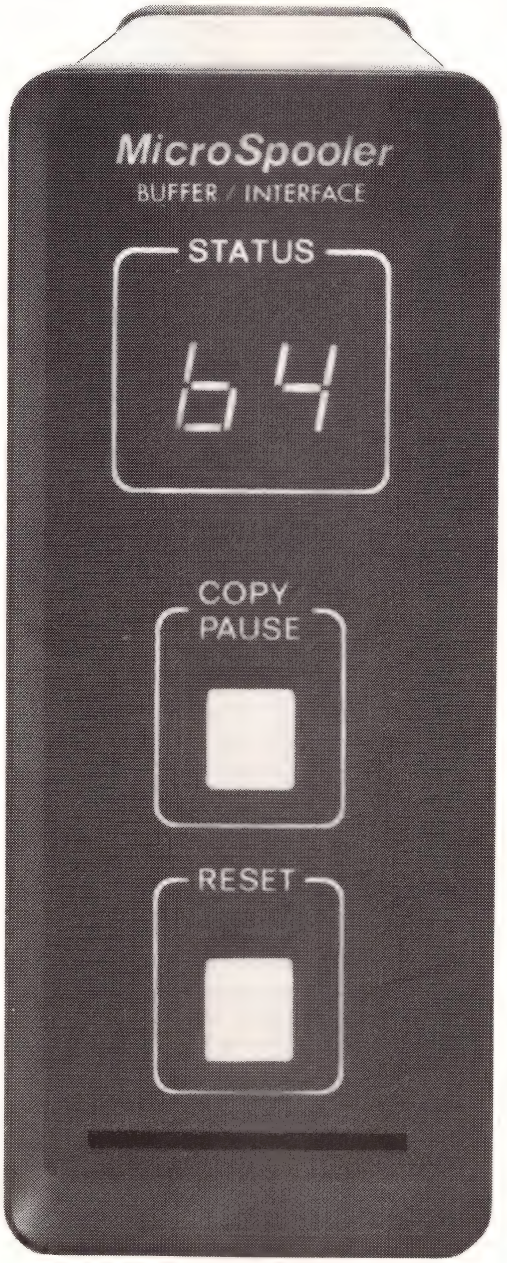
385 Sydney Rd. Balgowlah N.S.W. 2093
Telephone 949 7195

MicroSpooler™

Imagine being able to use your computer seconds after beginning an extensive printout. Visualise your printout with page breaks, page numbering and titles, margins of your choice, indented carryover lines, on any size paper! Appreciate the time and money you will save by not waiting on your printer.

MicroSpooler, a buffered printer interface, maintains control over your printer while you go on using your computer for more productive activities. Eliminate waiting while your printer pecks through a long document. MicroSpooler accepts information from your computer at up to 2500 characters per second and feeds it to your printer as fast as it can handle it — without using any of your computers memory or time!

As soon as MicroSpooler has stored your document in its buffer, control of your computer is returned to you.



Features include:

- *Status Readout — The front panel digital readout continuously updates itself to display either the amount of memory in use (in kilobytes) of the number of copies selected.*
- *Multiple Copy Function — For running up to 99 duplicate copies of the data in the buffer.*
- *Pause Function — Temporarily halts data output to the printer to allow paper adjustments, etc.*
- *Internal Power Supply — Allows MicroSpooler to operate Independently of either computer or printer.*
- *Self Testing — Performs a comprehensive check of most internal functions and memory. Indicates defective IC's in the unlikely event of a failure.*
- *Front Panel Reset — Empties the buffer of unwanted data.*
- *16K Memory — Factory expandable to 32 or 64K.*
- *Independently Selectable Baud Rates and handshaking on the serial models' ports.*

Dealer enquiries welcome

Enter K048 on Enquiry Card

The new face of typesetting

The marriage of micros and word processing with the new technology of photo-typesetting amounts to a revolution in the printing industry. And, as Dennis Keyes reports, Australia is a world leader.

MOST people are aware of the variation in print quality between dot matrix and letter-standard daisywheel-type printers. Anyone contemplating the production of business correspondence via word processing would be conscious of the need for the latter.

But not as many people are aware of the wizardry that can be accomplished by professionally set type. This has an impact greatly superior to even the best letter-quality device. Typesetting offers variations to the size and style of type, boldness and underscoring for example.

This sort of service has always been available to those willing to pay the price, but its use has now been extended considerably with developments in both the printing and computer industries.

Local initiative has seen Australia become a world leader in the application of this new technology. A range of services is now available to cater to this growing market segment, with some interesting variations and experiments. This is a description of three of them.

Smith and Miles

Smith and Miles is a large, established Sydney company which has offered some form of computerised photo-typesetting since 1970. Its system revolves around a Data General Eclipse front-end, running Penta software, that makes all the necessary text manipulations before the actual characters are generated on photographic paper.

The Penta system does all the preliminary number crunching to select size and type of character font, distance between individual characters (for example, you might want an A and a W closer together than an A and a J), and to optimise the layout and number of characters per page. This leaves the actual photo-typesetter unencumbered by such considerations, and hence not a bottleneck in graphic-arts output.

The DG/Penta combination functions just like a normal multi-terminal computer system, with professionally trained compositors using individual screens to lay out work to a client's needs before submitting the job into a batch queue for the number-crunching operation on a priority basis.

The photo-typesetting unit is a physically separate device connected by a communication channel to the DG Eclipse. It operates with fibre optics technology, having all the typefonts stored in a digitised format.

Thus, several different character styles can be used in the one job simply by loading them from their individual diskettes.

The technology enables the digital code to be manipulated into characters of varying size and position (depending on the client's requirements) and imprinted on the final photographic paper — the bromide.

The development of photo-based techniques, replacing the older concepts of hot-metal type and engraving, has made many more small one-off jobs financially feasible.

Interfacing micros

Another development — paralleling the revolution in printing technology — has been the interface with business computer systems.

The first phase in this involved using computer printout as a "hard copy" source for complete rekeying prior to photo-typesetting. This service is still offered by all organisations in the industry, where the client marks the printed sheets with instructions for the sort of type and highlights required.

The next phase saw the direct use of magnetic tape output from a client's own computer. This service is also still available. It eliminates rekeying, but requires a printed equivalent to specify the layout. These days, it's better suited to jobs where the text and/or figures are to be extracted from certain fields only within the given data.

The third phase came with the development of word processing on a large scale and, in particular, its availability on microcomputer systems. Again, computer output is taken directly, but this time, it is the whole text.

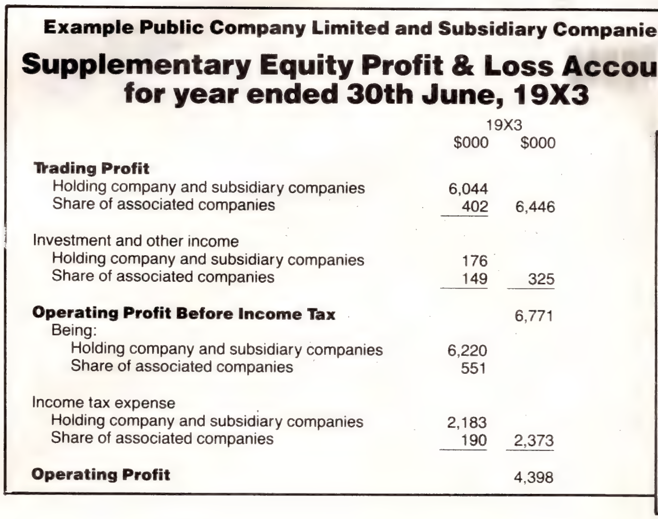
This third phase eliminates what has always been the most significant expense in typesetting — character keying and proofreading. It became possible with data transfer over telephone lines, and more recently, with the development of interface units able to read a variety of diskette formats and sizes.

The printing, or, more correctly, the photo-typesetting industry went one step further by agreeing with clients on a set of codes which could be directly embedded in the text to further facilitate typesetting operation. These codes are a series of infrequently used characters that act as commands. They control such things as the style of type, the size, and any other special edit features. Elimination of the rekeying and proof-reading stages saves between 25 and 45 per cent in costs.

A microcomputer user of word processing now has the choice of submitting straight hard copy (still valid for some smaller jobs), diskette plus hard copy, or a transmission via the phone lines. These options can all be combined with command codes embedded in the text of the hard copy, in the magnetic output, or both.

Smith and Miles' general manager, Bruce Archer, is excited about the new concept and the part that Australia is playing in utilising the new technology — even aside from the involvement of his own company. He explains: "There has been a growing awareness of the importance of computers to this industry ever since the impact of photo-typesetting and the removal of metal type.

"I'm surprised and delighted at the extent to which we, here in Australia, have embraced the benefits of these

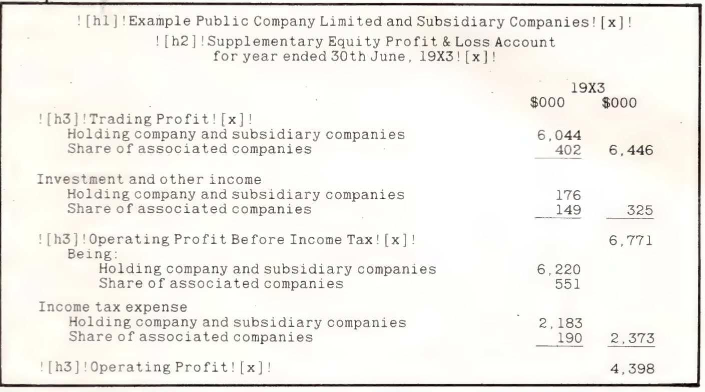


Example Public Company Limited and Subsidiary Companies

Supplementary Equity Profit & Loss Account for year ended 30th June, 19X3

	19X3 $000	$000
Trading Profit		
Holding company and subsidiary companies	6,044	
Share of associated companies	402	6,446
Investment and other income		
Holding company and subsidiary companies	176	
Share of associated companies	149	325
Operating Profit Before Income Tax		6,771
Being:		
Holding company and subsidiary companies	6,220	
Share of associated companies	551	
Income tax expense		
Holding company and subsidiary companies	2,183	
Share of associated companies	190	2,373
Operating Profit		4,398

Defined codes inserted in copy (below) can incorporate instructions for type style, width, indents and spacing to produce typesetting like that at left.



```
             ![h1]!Example Public Company Limited and Subsidiary Companies![x]!
                   ![h2]!Supplementary Equity Profit & Loss Account
                         for year ended 30th June, 19X3![x]!

                                                                    19X3
                                                                $000    $000
![h3]!Trading Profit![x]!
    Holding company and subsidiary companies                    6,044
    Share of associated companies                                 402   6,446

Investment and other income
    Holding company and subsidiary companies                      176
    Share of associated companies                                 149     325

![h3]!Operating Profit Before Income Tax![x]!                           6,771
    Being:
        Holding company and subsidiary companies                6,220
        Share of associated companies                             551

Income tax expense
    Holding company and subsidiary companies                    2,183
    Share of associated companies                                 190   2,373

![h3]!Operating Profit![x]!                                             4,398
```

developments. This was brought home to me vividly about three years ago, when I gave a lecture to the Society of Industrial Editors in the US — not one of them were as advanced as we are.

Operating in a different segment of the market, but still with the same principles and type of service, are Hughes Phototype and Mervyn Beamish Graphics.

Hughes Phototype

Hughes concentrates on the transmission of data via modem or acoustic coupler, and has an Australian-developed "black box" plus microcomputer to handle the communication interface and the insertion of typesetting commands in place of the user-generated codes. Jock Murray, general manager of Hughes, explains:

"We still operate our transmissons at 300 baud — we haven't found 1200 to be all that reliable. With our lower overheads, we're able to offer a very competitive price on the smaller jobs that would require rekeying if submitted to the larger companies.

"For example, with telecommunications the client can send a 50,000-character job — which is something like an eight-page newsletter — for around $8, in many cases cheaper than the cost of sending the document by courier."

Hughes' photo-typesetter is a Mergenthaler, a European unit, with laser scan and digital fonts. However, it's the flexibility offered by the front-end microcomputer that's the key to the efficient, inexpensive service. The typesetting front-end is dedicated to the number-crunching activity of character alignment, pagination, etc.

Mervyn Beamish

Mervyn Beamish Graphics offers a wider range of input types, with micro manipulation of the text prior to visual output, and some interesting experiments with remote keying of data. Mervyn Beamish explains:

"We offer input via diskette, cassette, direct hard copy, or telecommunications. We use a Commodore micro to do most of the text handling before it even gets into the attached, but distinct Quadritek typesetter. We're more attuned to smaller jobs, but we've got a good range of capability.

"We've actually tried farming out some of our text preparation work to people operating from home. The idea here was to have a competent person who was very familiar with our typesetting codes prepare the customer's raw data and insert the appropriate commands.

"It didn't quite work out as successfully as hoped, because of great variation in the client needs. It turns out to be far more efficient to teach the customers' personnel how to use lthe embedded commands rather than have someone do it all for them. ☐

THIS REMARKABLE WEEKEND PACKAGE
WRAPS UP YOUR BUSINESS WORRIES

NEC Advanced Personal Computer
2 MEGABYTES DISK STORAGE
12 Month Warranty

Personal Computer of the year.

- Weekend at Hilton Hotel
- Software – Complete Accounting Package. Includes Word Processor or software to equivalent value.
- 2 Days Training
- Video Cassette recorder to watch your training tapes or a camera if you already have your Video Cassette.

If bought separately value $8,000.00

RING NOW! VACANCIES ARE LIMITED
DIRECT DATA — 1065 High Street, Armadale, Vic, 3143. Phone: 20 6949

H&M

Enter K089 on Enquiry Card

Economies of small scale

An instant printer has seized on a new twist to an old technology to market personalised computer stationery cheaper and faster than the established large operators. Dennis Keyes reports.

AN Australian company is offering personalised continuous computer stationery in low volumes in about one fifth of the time required by larger printers and is still able to make a profit. The secret? Old technology — revamped.

Posh (Computer Stationery) Pty Ltd uses the letterpress rather than the offset printing process. Another factor in its success is the modularity of its equipment.

Roy Hague, a director of the company, explains: "Letterpress is the older form of technology, and involves transferring the image direct from an engraved template on to the paper, while in offset, the image is first used to prepare a rubberised mat which carries the details through to the printed medium. Because of materials and techniques now available, a letterpress template can be changed fairly rapidly — for variations to an invoice layout, for example — and we can avoid the intermediate step of having to alter an offset mat.

"This sort of approach is more amenable to short runs and frequent changes of layout. It's old technology with a new twist."

And the modularity of the equipment? "Well, the continuous forms business is a little more complicated than normal sheet printing and errors in production can have a far more disasterous effect. It's not just a matter of tossing a few sheets aside, since you're in the middle of a continuous roll.

"Now, essentially, there are three component parts to the process — conversion, printing and the final collation. The first involves taking the raw material, sprocket-holing it and crimping it for the page folds. The other two parts are self-explanatory and collation is only needed with multi-part forms.

"For their own economies of scale, the larger printers look at the whole process as one unit, whereas we consider it as three distinct operations.

"Now this is of advantage to both us and our clients, because we can offer them savings right from the raw material stage and give them a mix of services.

"Some people will not require multi-part forms and others may not even need the personalised stationery, so by running as three distinct units, we can build up stocks of standard items and not have the personalised printing held up by the conversion process, for example."

The company is an offshoot of Posh Instant Printing, one of many organisations offering a fast turnaround, inexpensive professional graphic-arts service to over-the-counter clients. The parallels between instant printing and computer stationery development are strong, as Roy Hague explains:

"It's just like history repeating itself, where a development in technology can bring about such a vast change in the economy of scale. In that case, it was the invention of a new camera, which made a quick service feasible and, coupled with personalised counter service, made the concept a winner.

"We're looking at the same thing here, and in line with this, we've adopted a marketing style new to the printing industry with the production of our price catalogue. This is the first time anyone has offered such a feature for smaller jobs."

ANNOUNCING . . .
THE CONQUEROR
A COMPLETE SOLUTION

Business/Scientific microcomputer
FOR UNDER $3000 — Including Software

. . . THAT INCLUDES THE CONQUEROR COMPUTER WITH A DISK DRIVE AND ALL THE SOFTWARE YOU NEED TO WORK BETTER AND FASTER WITH WORDS, WITH NUMBERS, AND WITH IDEAS, NOW.

POWERFUL NEW MICRO
Z80A CPU, 4 MHz.
64K RAM
2 SLIMLINE 5¼" DSDD DRIVES
2 RS232 SERIAL PORTS
COMPACT 6" x 6" x12" CABINET
*OPETIONAL: 256K RAM, PARALLEL PORT, ADDITIONAL SERIAL PORTS

POWERFUL SOFTWARE
COMPLETE SOFTWARE PACKAGE INCLUDING:
—CP/M COMPATIBLE OPERATING SYSTEM
—PBASIC
—SYSTEM UTILITIES
—SPELLBINDER WORD PROCESSORS
—DBASE II FROM ASHTON TATE
—A TOTAL OF OVER $3000 WORTH OF POPULAR SOFTWARE—FREE

MULTI-USER
SO YOU NEVER HAVE TO OUTGROW YOUR CONQUEROR YOU CAN EASILY UPGRADE WITH ADDITIONAL DRIVES OR HARD DISK STORAGE AND GROW TO A MULTI-USER SYSTEM WITH A MAXIMUM OF 16 USERS AS YOUR NEEDS GROW.
DATA LOGGING SYSTEMS ALSO AVAILABLE

DEALER ENQUIRIES WELCOME

Now we also include "Business Master" full accounting system—(A/R, A/P, G/L, Stock/Invoicing)

Commercial and Professional Microsystems
9th Floor 505 St Kilda Road Melbourne 3004
Telephone: (03) 267 4755
Branch: 18 Park Rd Warburton 3799. (059) 66 2037

Enter K075 on Enquiry Card

Printer delivers top job at lower cost

A high-powered, high-speed, professional, buffered daisywheel printer — the Daisywriter is all that and more, as Russ Adams discovers.

I'VE tried portable printing terminals, 140kg used band printers, little, silent, thermal printers, strange-typestyled dot-matrix printers and cheap, but slow, daisywheel printers. Every one of them missed some critical element.

I was about to give up the image of my ideal printer when I saw it — the Daisywriter 2000. The Daisywriter 2000 uses the same print mechanism found in the Brother HR-1 — but that's where the resemblance ends. Without a doubt, this printer outperforms daisywheel printers twice its price.

The 2000 is packed with features. It was designed to be as universal a daisywheel as possible.

Daisywriter can imitate the protocols of almost every letter-quality printer now being marketed. It can change into a Diablo 630; Qume Sprint 9/11; NEC 3500, 5500 or 7700; Centronics 737; and the IBM PC printer. You make these quick changes by flicking a few switches.

Not only only does the Daisywriter understand computers that speak different protocols, but it also understands different "human" protocols. Sixteen different languages are switch-selectable.

If this weren't enough, the Daisywriter is also "hardware multilingual". It comes ready to connect to a Centronics 8-bit parallel, IEEE-488, RS-232C or 20-milliamp current loop interface. All the circuitry is built into the Daisywriter. All you need is the correct cable.

Then there's the built-in print buffer — 48K-bytes! A print buffer is memory that can store data quickly while the printer continues to print at its normal speed.

The process, commonly known as *spooling*, allows your computer to transmit your document to the Daisywriter at maximum speed. Then you can use your computer for some other task while Daisywriter prints away.

You can reprint the contents in the buffer up to 255 times either by giving a command from the printer's front panel or by using a software command during spooling. In fact, the Daisywriter has more than 75 software commands that change its operation.

Specifications such as form length, characters per inch and lines per inch are all software-selectable.

You can also activate automatic margin justification and true proportional spacing by software control and automatically centre a line and reset the margins.

The True Proportional Spacing feature uses an internal character-spacing table that is optimised to Linotype standards. You're not stuck with only the provided spacing table, however. Issue a software command, and you can generate your own spacing table, if you are so inclined.

Baud-rate selection — what could the Daisywriter designer do that would be outstanding in this area? Why, provide automatic baud-rate selection, of course.

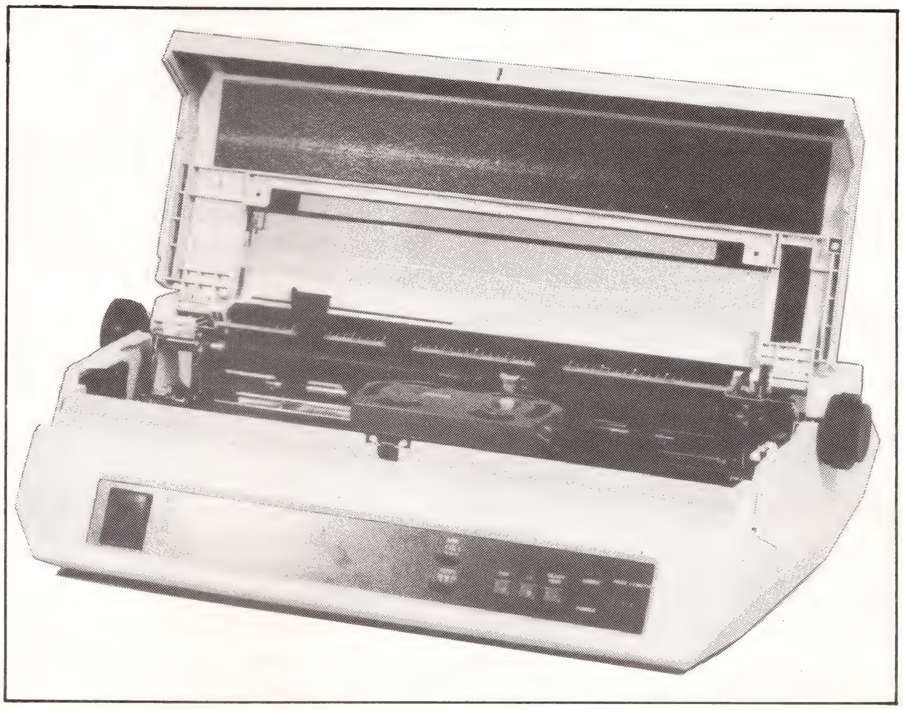
When you activate this feature, you need only transmit a carriage return to the printer, wait two seconds and the printer's baud rate is set to the data-transmission speed of your computer. You can manually switch-select the baud rate from the printer's front panel as well.

The Daisywriter has subscript and superscript commands and even has commands for underlining, printing in either shadow or boldface, and using black or red ribbon.

Finally, using the software control, you can set the printer into a Graphics mode. This allows absolute or vector plotting for drawing graphs or charts. The Graphics mode of the Daisywriter is compatible with Diablo HYPLOT.

The printer mechanism used by the Daisywriter's manufacturer, Computers International, is made by Brother Industries. This mechanism, in production for two years, has some outstanding design features.

A linear stepping motor drives the print carriage along a stainless-steel track, which eliminates the belts and



pulleys that often cause malfunctions in other printers.

The mechanism uses a print-wheel cassette, available from Brother typewriter dealers, that protects the print wheel from damage. By using a standard IBM ribbon cartridge, Daisywriter's designers have enhanced its reliability and simplified the search for replacements.

By using four internal CPUs, they have reduced the number of moving parts and the number of electronic components. Usually, the fewer parts a printer has, the more reliable it is.

If you lift the Daisywriter 2000's lid, you discover an important undocumented feature that makes office or home use more pleasant — a high level of soundproofing.

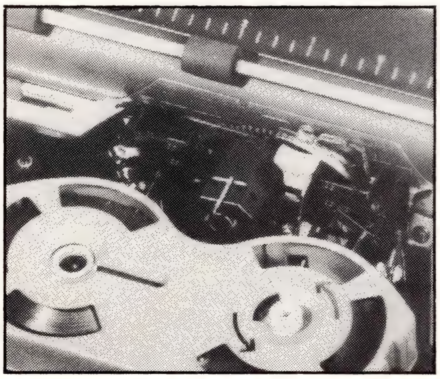
In my subjective opinion, the operation of the Daisywriter is noticeably quieter than that of an NEC 3515 or a Smith Corona TP-1.

I tested each of the software control features with the exception of the HYPLOT-compatible graphics. Each worked as advertised. I found the biggest problem was getting my word processor to make use of all the features.

I spent eight hours playing with my word processor's parameters and have yet to tap all the features of the Daisywriter.

For years I have had my Apple's serial port set to 300 Baud. I had to see if the Daisywriter's built-in 48K print buffer would really work. I dug out the owner's manual to my Apple serial interface to find out how to increase the speed of transmission.

I set the speed to 9600 baud, turned my Daisywriter on and gave my word processor the command to print. The Daisywriter's buffer sucked up a 20-page manuscript as fast as my Apple could transmit it.



Brother HR-1 print mechanism.

australian **Micro** computer magazine

Hardware Report Card

Daisywriter

	Poor	Fair	Good	Excellent
Setup	☐	☐	☐	☑
Ease of Use	☐	☐	☐	☑
Performance	☐	☐	☐	☑
Documentation	☐	☐	☐	☑
Serviceability	☐	☐	☐	☑

Features of unit tested

- Z80-based, letter-quality printer
- Built-in, 48K print buffer
- Built-in, self-diagnostic test
- Software controls for self-justification, proportional spacing, line spacing, characters per inch and other word-processing functions.

Price: $A2250.

Distributor:
Paperwork Systems, 124 Walker St, North Sydney 2060. Telephone: (02) 922 5322.

The limitations to my document printer are now attributable to disk-access time!

The advertisements say Daisywriter prints at 40 characters per second (cps). A printer's actual speed depends on what you are printing. Generally, the more white space, the faster the printing speed.

With the Daisywriter's large print buffer, however, printing speed is far less important than with most printers because the buffer allows the computer to transmit its text at maximum speed.

PSI have solved the weakest link in the installation of a new printer. They supply cables made for particular machines with cables available for over twenty of the leading microcomputers. The power switch is on the left side near the front rather than on the back.

All of the switch-selectable features are set by 24 DIP switches located under a small door on the front panel. You don't have to "dig" around inside as you must with some other printers. The On position of each switch is marked clearly, so setup is easy

The plastic print guard is marked with several red lines that show where characters will be printed. Line up these with the top of a sheet of paper, and the paper is properly positioned.

If you are using cut sheets, you do not have to manually retract the paper bail for the first five lines, because the printer automatically retracts the bail until the sheet has advanced enough. Then the bail clamps down on the paper to prevent paper jams.

A clearly marked type-position guide shows the location for 10, 12 and 15-pitch typing. This guide really helps when you are resetting margins after you've changed pitch.

The printer sounds different "bells" for paper out, print jam and cover open, and the printer even has a built-in self-diagnostic test to help you identify printer problems.

A user's guide and an information manual code with the Daisywriter 2000. Both are typewritten photocopies. They are clearly written and provide surprisingly complete information.

The information manual is more than 45 pages long. It clearly describes how to set the 24 DIP switches to set up the functions you want.

It explains each of the features along with the software commands to activate them. Both the ASCII and hex codes for each command are included, along with a special "Daisykey" code, useful for some computer systems.

Two shortcomings require further attention from the authors. The information regarding the Graphics mode is insufficient, and you need to do a good deal of experimenting to use this function. Examples illustrating its use are really needed.

The manual also lacks information regarding how the commands change when you switch to emulation of another printer.

In my opinion, the Daisywriter 2000 offers the best value in letter-quality printers of any on the market today. It is a high-powered, high-speed, professional, buffered, daisywheel printer. I'm delighted with mine. ☐

PORTABLE COMPUTER? ... GO WITH THE PROS. INSYSTEMS & ZORBA.

NEW
8088 based CPU card retrofit giving IBM-PC compatibility.

The ZORBA computer is the smartest available. It's small and light enough to take with you, yet big enough to handle highly complex computing tasks.

ZORBA reads other computer's disks (inc. IBM), responds faster, has greater storage capacity, and comes with WordStar, CalcStar, MailMerge, CBasic, CP/M and M-80.

FEATURES

- Superfast dual 400K disk drives.
- Superior keyboard with function keys and numeric pad.
- High resolution 7″ display.
- 80 x 25 display format.
- Rugged construction - only 10kg.
- Versatile communications set-up program.
- Terminal emulation program.

insystems

337 Moray St., South Melbourne, 3205.
Telephone: (03) 690 2899.
Suite 11/84 Pacific H'way, St. Leonards,
N.S.W. 2065. Telephone: (02) 439 3788.
Perth (09) 384 5511, S.A. (08) 44 8050,
Qld. (077) 75 3044.

$2995 Exc. Tax

SME 587

Enter K019 on Enquiry Card

WESTERN AUSTRALIANS
choose Computer Age

Everything for the Apple computer professional or hobbist, or for business applications.

OTHER LANGUAGES: Pascal, Logo, COBOL. FORTRAN, PILOT.

PROGRAMMING: Instruction books, assemblers, debuggers, disassemblers.

MAGAZINES & BOOKS: APC, ABC, Apple Orchard, and others.

COMMUNICATIONS: The Source subscriptions, Midas and Telecom applications acoustic couplers, communication programs.

PRINTERS: — We sell more of the excellent Epson MX100 printers than any other shop in WA.
— use your electronic typewriter (e.g. IBM ET) for word processing with the Missing Link interface board.

PROGRAMS: For accounting, business and professional, communications, databases diaries, education, farm, graphics, word processors, system and utility software, and numerous games, are available.

COMPUTER AGE

Shop 3, 355 Stirling Highway, Claremont, WA 6010 (09) 384 1559

apple computer
® Authorized Dealer

We Service and Support What We Sell

Enter K044 on Enquiry Card

NEW!

Deloitte Haskins & Sells' Businessman's Guide to
MICRO-COMPUTERS

Deloitte Haskins & Sells, a firm of Chartered Accountants, has developed this guide to assist businessmen in choosing and using micro-computers in their business. It is . . . .

Relevant

containing information on products currently available in Australia and New Zealand.

Business orientated

concentrating on applications for financial modelling, databases, word processing and general accounting.

Independent

giving the authors' subjective comments on specific micro-computers and software products rather than merely providing details that could be obtained from advertisements.

Practical

including checklists, summary charts and other information to help you make a sound purchasing decision.

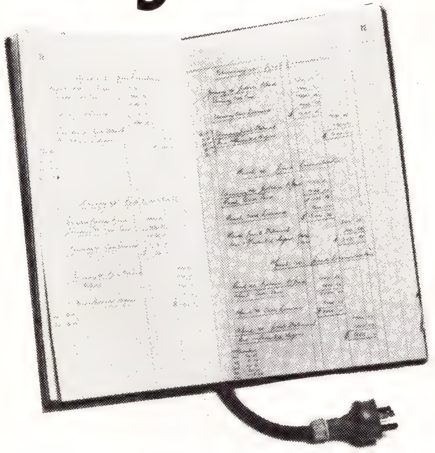
It has been written in a practical, easy-to-read style telling businessmen almost everything they need to know about micro-computers.

Available now from all good bookshops!

In case of difficulty send your cheque for $19.95
to: **Prentice-Hall of Australia Pty Ltd**
209 Glenhuntly Road, Elsternwick 3185.

Enter K045 on Enquiry Card

If your cash book hasn't got a 3 point plug.



It's probably out of date.

Tired of the tedious task of Cash Book Writing ? ? ?

. . . Then do it quicker and cheaper Electronically . . . use

Electronic Cash Book

THE ELECTRONIC CASH BOOK IS DESIGNED FOR THE SMALL BUSINESS AND ALLOWS THE OFFICE MANAGER TO ACCURATELY MONITOR ALL ASPECTS OF CASH MANAGEMENT

AVAILABLE FOR:

* COMMODORE 64

* COMMODORE 4000

* COMMODORE 8000

The Commodore 8000 version can also be supplied with a comprehensive General Ledger.

THE ELECTRONIC CASH BOOK is menu driven and offers 9 main menu options:

- *Setup/modify Dissection Codes*
- *Setup/modify Periodical Payments*
- *Enter/modify Transactions*
- *Bank Balance/Cheque Inquiries*
- *Reconciliation*
- *Reports/Summaries*
- *Disk Handling*
- *Budget/Dissection Entries*
- *Reference Entries*

FOR USE IN BUSINESS OR HOME
Prices start from $195.00

FOR FURTHER DETAILS CONTACT:

PITTWATER COMPUTERS

PHONE: (02) 939 6760
OR YOUR LOCAL COMMODORE DEALER

Enter K043 on Enquiry Card

Roland Quality at affordable prices.

The 10ACC release features:
- 8-pen XY plotter,
- 2 speeds,
- 180mm/sec (max.),
- RS232 & Centronics interface ports,
- 360 x 260mm plotting range,
- Magnetic paper grip,
- and is a low-cost high performance CAD/CAM & graphics plotter.

There's also a Roland DXY-101 single pen plotter available.

You'll never find better value in 14" RGB or Composite Color monitors.

CC141:RGB System
Has a 14" Hi-Res color display.
IBM PC compatible, also
Apple II with optional Apple
RGB card.

CB141:Composite System
Complete with built-in
amplifier and speaker.

Both products feature non-glare screens and feature built-in fault protection.
Ask about our AMDEK green and amber screen monitors.
Full 12 months warranty on all products, plus full service support
from our Sydney and Melbourne service centres.
See the Roland range at Stand 96 at 10ACC exhibition.
Dealer and OEM inquiries to Adrian Stephens, Melbourne.

Roland DG

39 Victoria St., Fitzroy, Victoria. 3065.
Tel: (03) 417 1800. Telex: 35276.

23 Cross St., Brookvale, N.S.W. 2100.
Tel: (02) 938 3911. Telex 27769.

Enter K016 on Enquiry Card

Film stirs debate on illegal computer taps

Now the general public knows that computer networks have become 'essential services', it's time for informed discussion. Tony Smith discusses the impact of Wargames.

AT the recent seminar on Marketing Native Technology, Australian computer designer Bill Hollier made the controversial point that if the computer industry was to communicate its vision of the future to the public, it had first to communicate it to society's communicators. The way to reach the policy-makers was through public opinion, and an important path to public was through artists, writers, etc.

A classic confirmation of Hollier's proposal has been provided by the widespread public impact of the motion picture Wargames. For the few who may not have heard about the film, it tells of a couple of youngsters who connect their home computer to US defence computers and, though it appears to them as just playing a game, almost start World War III.

At one extreme is the reaction of Perth-born, Hong Kong-based business tycoon Bill Wyllie who advocated, while speaking at the announcement of an OEM agreement between Hewlett-Packard and Tech Rentals, that everyone must see Wargames. Wyllie, who is Tech Rentals' financial backer, had seen the film in the US.

At another extreme is the reaction of ordinary buyers of personal computers to the possibility of using them to tap into other people's networks. One small suburban computer shop reported having received 14 inquiries from potential purchasers of modems or acoustic couplers within a week of Wargames being released in Melbourne — more than twice as many such inquiries as in the previous 12 months.

There are already well-documented cases of the boom in network penetration in the US since the release of Wargames, with the more practical target of banks being even more popular than the Department of Defence. While such intrusions are not new from the hacker community or serious computer criminals, the big new factor is the general public getting into it just for kicks.

While some laws have been able to be used against detected intruders, the law has regularly been shown to be deficient in providing means of retribution for such activities.

The real question to be addressed by this explosion of public access to data is whether it will be possible to keep any electronic secrets in the future. There is no doubt that the momentum towards widespread access to a worldwide public-data network is unstoppable, with its establishment just around the corner. □

Phone connections cheaper, easier

AS if to cater for the Wargames fallout, there has been a sudden explosion in the supply of equipment which can be used to connect computers to networks via phone lines.

For the past couple of years, that market in Australia has been effectively dominated by ElectroMed's Sendata acoustic couplers. There has been a basement price of $300 for such equipment to provide minimum level 300 baud dial-up access.

Suddenly, a series of breakthroughs have occured, both in the range of equipment offered and its asking price. Because of peculiarities of the Australian telephone system, virtually all companies supplying connected equipment to it use totally Australian design and manufacture. Victorian companies Electromed and RF Computer Communications have both broken this $A300 price level with the release of direct connect, 300 baud, modems for under $A200.

universal data
MODEM

For commercial and personal computer users.
1200/75 and 300 BPS switchable plus U.S. frequencies. Auto answer/disconnect. Auto dial.
*Free membership of the Australian Beginning.
Call Alex Rosser or write.
Suite 1, 55-65 Phillips St,
Parramatta, NSW 2150

Telecom plug compatible.

Enter K067 on Enquiry Card

RAPID RIBBON COMPANY WHOLESALE PTY LTD

Largest range of ribbons in Australia

We deliver a comprehensive range of ribbons for computers, printers, electronic cash registers, calculators, typewriters and ribbons for all business machines. Also print wheels and thimbles.

We delivery **immediately** Australia wide.

Coloured ribbons now available for all printers and typewriters. We have the A to Z range of ribbons — Why not ring us now?

RAPID RIBBON COMPANY WHOLESALE PTY LTD
83 Longueville Road,
Lane Cove NSW 2066
Phone: (02) 428 3833
Telex: AA74650

OEM & Stationers enquiries welcome.

Enter K066 on Enquiry Card

Interdependent relationship

Microman:
By Gordon Pask and Susan Curran.
Published Century Books, 1982.
Price $A12.95.
Reviewed by Ian Webster

GORDON Pask starts his book: "This is not a book about computers. It is a book about the developing relationship between human beings and computers," and continues: "They are a species in their own right, neither independent from use, nor subservient to us."

Pask is a distinguished English cybernetician, who has been exploring the possibilities of our involvement with computer-based technology.

With English computer journalist Susan Curran, Pask has written a clear introduction to the information environment and the possible consequences of our involvement with that environment.

He starts with a delightful summary of the development of computers then discusses attitudes towards living with primitive machine intelligence, including the results of a 1971 *Time* survey of attitudes to the use of computers which reveal people's Jekyll and Hyde perception of the technology.

Pask then explores the concept of machine intelligence by considering consciousness, language and knowledge. He puts forward the idea of populations of computers, to enable computer systems to develop the conflict resolving processes necessary to produce self-organising activity.

Microprocessors are briefly introduced as the personal dimension of computing, then he extend the concent of the microcomputer to talk about different ways of computing. His concern is that the architecture of the computer is limited.

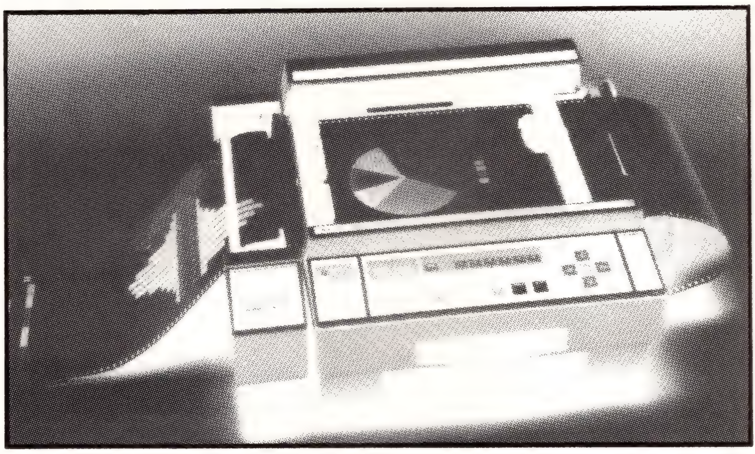
He suggests that founding computing on an idealised Western model of sequential logical, deductive thought has tended to limit the computer's application. He presents a series of maverick machines, to illustrate the importance of not being bound by preconceptions of what computers are.

Finally, he discusses the best and worst of possible worlds and the possibility of influence and control. He says "the information environment builds itself, no group or person has a controlling option." He suggests four conservation laws for dealing with information environments, concept sharing, concept creation, sufficient privacy and balance.

Gordon Pask and Susan Curran have written an important book that explores areas being considered by people investigating the broad interface between the human species and its extensions.

AT LAST . . .
AN AFFORDABLE MULTICOLOUR PLOTTER

National
VP-6801A



A-4 Type Digital Plotter
6-color Graphic
Intelligent software
High speed, 200mm/sec
Intelligent software

Input requirements
1 ASCII 7 bit parallel interface
2 GP-IB interface (IEEE standard 488-1978 compatible)
3 RS-232C interface

SCIENTIFIC DEVICES AUSTRALIA PTY LTD
2 JACKS ROAD, SOUTH OAKLEIGH,
VICTORIA, 3167 PHONE: 579 3622
31 HALSEY ROAD, ELIZABETH EAST, S.A., 5112 PHONE: 2555 6575
35-37 HUME STREET, CROWS NEST, N.S.W., 2065 PHONE: 43 5015

DISTRIBUTOR ENQUIRIES WELCOME

Enter K557 on Enquiry Card

Be in it mate!

TAKE one closet hacker, preferably yourself, and write down his most recurrent daydream. Then write down a couple of interesting things necessary for the realisation of that dream. Finally, come to grips with the concept of a computer not yet on the market: that might make it easier to do at least one of the things necessary to make the dream come true.

Now look at that computer concept and make a list of 10 or more other things it should obviously be capable of doing. Find half a dozen people, one will do if she is rich, who might be able to make use of one or even two of those functions. You have completed your market research.

Make some basic decisions. Of course you will build a bus-based system. No Ocker could possibly afford to put everything his computer might want to do on a single board. It will obviously be an industry standard bus, or at least your own non-standard version of one. It might as well be S100. It has the most exciting catalogue of options.

Find yourself a design engineer, preferably one who will take a share of the revenue in lieu of wages. Don't worry too much, there are plenty about. It's a pretty easy job anyway, and if his only previous design was for a tech practical he will have fewer dangerous inhibitions.

Go though an S100 catalogue and pick out the bits that will do 90 per cent of what you need. Knock out an original board design to do the other 10 per cent and, just for good measure, improved versions of two or three others out of the catalogue.

Order one of each of the required catalogue boards, power supply, standard chassis, terminal, printer and operating system on consignment and spend next week's pay on working up the unique port. But be sure you won't have to leave your secure job for a few months yet. Eureka! You have built an Ocker computer.

Find a friend who has a small business and tell him your computer is just what he needs and sell it to him for twice the cost of its components so you can build another one for development and backup. Spend all your spare time for the next six months writing custom software so he can do something useful with his computer. You had forgotten to say he would need to pay for software before your creation would be any use, and you haven't the heart to tell him now.

Write a business plan and show it to an accountant. Throw it in the rubbish bin and write another one. Show it to a solicitor. Throw it in the rubbish bin and write yet another.

Waste six months paying information tax to banks, "interested" corporations and government departments which had no intention of doing anything for you in the first place.

Take the plunge. Mortgage three of your grandparents' homes. Find some downmarket premises. Hire some downmarket but enthusiastic staff. Wait six more months for your own circuit boards to be photo masked and start coming off the production line.

Get out the old soldering iron and patch wire. Discover that economic moulded cabinets are unobtainable in this country so compromise with a sheet metal worker who will do a pretty good job because it's the only light in his tunnel. Assemble three complete units.

Convert four acquaintances to prospects and bust your last $2,350 on a Penman launch. Ocema! You are now an Ocker computer manufacturer. □

Strategineering

THE rumour mill has really been grinding away in anticipation of IBM's new releases.

There is no question that IBM uses the Russian technique of distributing disinformation to confuse intelligence gathering. IBM also uses what I call the *hole-in-the-ground technique* to destroy the competition. IBM digs a *big hole* in the ground and covers it with leaves. It then puts a big pot of gold nearby. THen it gives the call, "Hey, look at all this gold, get over here fast." As soon as the competitor approaches the pot, he falls into a pit.

IBM has allowed the add-on-card makers to gear up for the pot of gold. If IBM then brings out some cheap super cards, it can leave the competitors holding a lot of unsaleable inventory, and probably put more than a few out of business.

Supposedly, the only thing that IBM is really worrying over is the next generation of the Tandy Model 100 machine.

The rumor mill has described the next TRS-80 Model 100 as follows: CMOS 8086, 456K RAM, 128K ROM, one-third the height of the Model 100, 16 by 80 flip-up LCD display, graphics controler for windowing, runs MS-DOS software.

Wow! □

Run a Professional Office

Top Professionals in the West choose from

COMPUTER CHOICE

The largest apple Dealers in Western Australia*
(*June 1983)

COMPUTER CHOICE
1297 HAY ST
WEST PERTH 6005
Ph.(09) 322 5651

Enter K555 on Enquiry Card

COMPAS PASCAL

You probably won't believe COMPAS until you've seen it. Standard Pascal in a single 22K byte program, including an advanced on-screen editor. Compiling 6000 lines per minute directly into native Z-80 machine code (not slow p-code), which runs faster than anything yet seen. Well, it's true, and it's here, available on any Z-80 based microcomputer with CP/M (version 2.2 or later).

COMPAS Pascal closely follows the definition of Standard Pascal, as set forward by Jensen & Wirth in the "Pascal User Manual and Report". Furthermore, several extensions are offered by COMPAS, to make it the most complete implementation of Pascal ever seen on a microcomputer.

- Dynamic strings
- Random access data files
- Structured constants
- Free ordering of sections within declaration part
- Alphanumeric labels
- Control characters in string constants
- Type conversion functions
- Program chaining with common variables
- Include files
- Full support of oeprating system facilities
- Logical operations on integers
- Bit/byte manipulation
- Direct access to CPU memory and data ports
- Absolute address variables
- In-line machine code and external subroutines

For your nearest dealer — phone:

K J COMPUTER SERVICES

(03) 772 0781, 772 9177

Bankcard and phone orders accepted.

Enter K556 on Enquiry Card

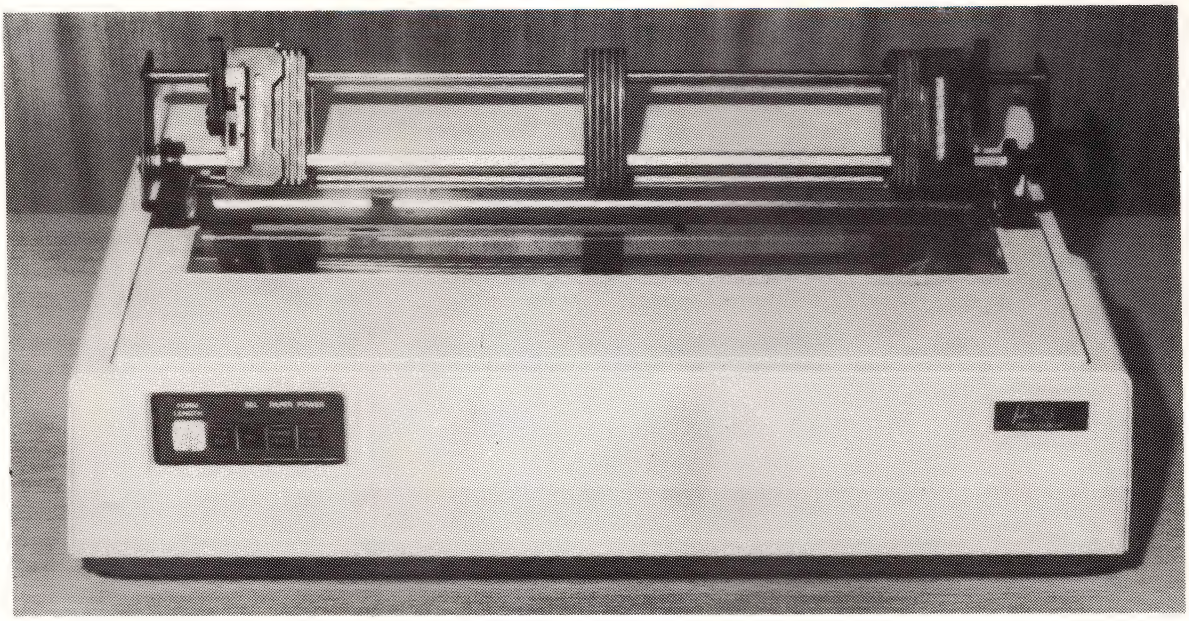
PRINTERS

LOGIC Suggests, when you consider

Performance, Reliability and Price

you cannot go past

MICROLINE



Whatever your needs, there's a model to suit

MICROLINE 92/93

- 160 CPS bidirectional
- Short line seeking logic
- Near letter quality mode
- Dot addressable graphics
- Forms control
- Friction, pin/tractor feed
- 5,6,8.5,10.12 and 17 c.p.i.
- Paper path — rear/bottom
- Head life more than 200,000,000 chars
- Paper tear bar (92)
- Parallel centronics/RS232C/IEEE

MICROLINE 82A/83A

- 120 CPS bidirectional
- Short line seeking logic
- RS232C parallel centronics I/F standard
- Forms control
- Graphics
- Multi-national character sets
- Paper path — rear/bottom
- Friction, pin/tractor feed standard
- Paper tear bar (82A)

MICROLINE 84

- 200CPS, bidirectional
- Short line seeking logic
- Near letter quality mode
- Dot addressable graphics
- Forms control
- Multi-national character sets
- Friction and tractor feed standard
- Downline loadable char sets.
- Head life in excess of 200,000,000 chars
- Parallel centronics/RS232C/IEEE

This month's special

The Outstanding MICROLINE 80 **$599.00** incl. sales tax.

* 80CPS * Roll holder * Snap-on tractor option * Paper tear bar * Friction & Pin feed * Graphics * 132 col. condensed * Parallel centronics/RS232C/IEEE

Call today for the best price on all models:—

Logical Solutions, Ted Keating, 87-91 Regent St Chippendale (02) 699 4910/4919
The Logic Shop, Andrew Holland, 330 Pacific Hwy Crows Nest (02) 439 1072
The Logic Shop, Allan Tainton, 97 Franklyn St Melbourne (03) 348 1488
The Logic Shop, James Powell Davies, 120 Murray St Hobart (002) 310 0818
Boss Computers, 921 Albany Highway East Victoria Park (09) 362 6999
Applied Data Control, 224 Glen Osmond Rd Fullarton (08)79 9211
L.E. Bougnen, 33 Railway Terrace Milton (07) 369 1277

Enter K064 on Enquiry Card

Aussie Byte

RDM Computers of Melbourne has released its Australian-designed and manufactured micro, based on the Aussie Byte single PCB. The standard system includes a Z80 processor, 256K-bytes of RAM 64K-bytes for VDU, battery clock and calendar, DMA, four serial ports, modem connection and Centronics interface. It supports a light pen for graphics and speech synthesis options. Up to four 5¼in/8in diskette drives and up to four hard disk drives are supported. CP/M 2.2 and CP/M Plus (Version 3) are standard and MP/M II is optional. RDM will soon release an optional plug-on board incorporating a 16-bit processor and memory, which will support CP/M-86 and MS-DOS.

Further information: RDM Computers, Melbourne. Telephone: (03) 481 0136.

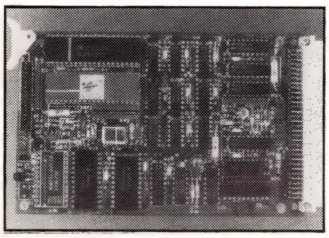
Enter K500 on Enquiry Card

High-speed CPU

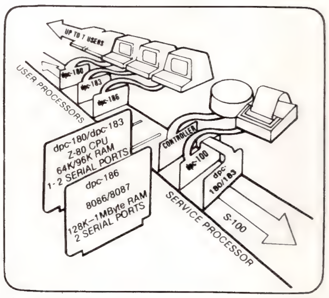
NATIONAL Semiconductor Corporation has released the CMOS Industrial Microcomputer CIM-804 high speed 4MHz CPU board, and the CIM-802A, an enhanced version of the 2MHz CIM-802. These industrial computer boards operate in ambient temperatures from -40 to +84C at low power consumption levels for remote station and process control applications such as industrial instrumentation, numeric machine control, pipeline monitoring and control, robotics and uninterruptable power supplies. The high speed CIM-804 is a board level computer that features 2K-bytes of static RAM, provisions for up to 4K-bytes of shadow PROM, up to 22 programmable I/O lines, 12 vectored interrupts, two 16-bit counters/timers with prescalers, and system-level failsafe timer. The CIM-802 CPU. New features include a PROM shadowing capability. Both CPUs are based on the NSC800 microprocessor. Manufactured with National's P^2CMOS technology, the NSC800 chip combines the execution speeds of NMOS processors with the power consumption and environmental advantages of CMOS.

Further information: National Semiconductor, Cnr Stud Rd and Mountain Hwy, Bayswater 3153. Tel: (03) 729 6333.

Enter K501 on Enquiry Card



National Semiconductor's CIM-804.



Architecture of the Discovery 500.

Discovery 500

ARCHIVES Computers has released the Discovery 500, an S-100 desk top single or multiuser system offering 8-bit and 16-bit microprocessors and up to 26M-bytes of inbuilt hard-disk storage. The system can support up to seven users using shared bus technology with the option of CP/M, CP/M-86, CP/M Plus or DPC/OS operating systems. Applications software based on Dataflex is available and basic system prices start at $A9000.

Further information: Archives Computers, 163 Clarendon St, South Melbourne 3205. Telephone: (03) 699 8377.

Enter K502 on Enquiry Card

Ontel release

KENELEC has released a 64K, CP/M computer called the Ontel 1505. The computer uses the 8085 processor and features a detached keyboard, 25 x 80 text display, serial and parallel ports and a range of storage options from 640K, 5in drives to 1.2M-byte, 8in drives and 5M to 96M-bytes of hard-disk storage.

Further information: Kenelec, 48 Henderson Rd, Clayton 3168. Tel: (03) 560 1011.

Enter K503 on Enquiry Card

Webster mini

AUSTRALIAN Computer manufacturer, DD Webster Electronics Pty Ltd, has released a new Spectrum Eleven minicomputer, its largest to date, with a storage capacity of 264M-bytes. Pricing for the Spectrum JJM, which ranges in memory capacity from 256K-bytes to 2M-bytes, begins at $48,825. The new M-bytes Spectrum incorporates two 14in Winchester disks each storing 132M-bytes with a disk transfer rate of 1M-byte a second and an average seek time of 40 milliseconds. Up to 18 users may share the JJM and back-up is by a 40M-byte streaming magnetic tape. Similar in design and concept to the Spectrum model JM which has one fixed Winchester disk of 132M-bytes storage, the JJM supports the DEC RKO7 compatible operating systems RT-11, TSX, TSX-plus, RSX, RSTS/E and Unix. The new Spectrum uses a DEC LSI-11/23 central processing unit, or the optional speed-enhanced 11/23 board, developed by the Webster design department to perform 30 per cent faster than the standard 11/23.

Further information: DD Webster, 17 Malvern St, Bayswater 3153. Tel: (03) 729 8444.

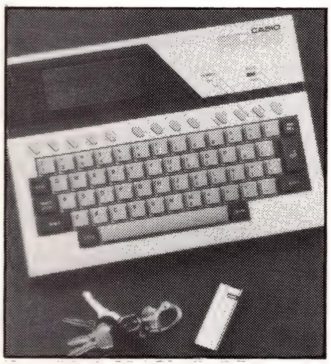
Enter K504 on Enquiry Card

Pocket wonder

MOBEX Casio has introduced the FP-200 pocket-sized computer. It has 20-column, eight-line display and connection terminals for a 4-color plotter/printer, mini-floppy disk storage and an acoustic coupler. The standard 8K-bytes of the RAM can be expanded to 32K-bytes, while the standard 32K-bytes of ROM can be expanded to 40K-bytes.

Further information: Mobex Casio, 72-76 Parramatta Rd, Camperdown 2050. Tel: (02) 516 4055.

Enter K506 on Enquiry Card



Casio FP-200 personal computer.

Handy keyboard

CANON has released the X-07 hand-held computer. The 4K RAM and 8K ROM computer features four 20-character lines of display or 32 x 120 dots for graphics. Its keyboard is arranged like a typewriter for two-hand operation. Basic is available in ROM together with 8K ROM softcards containing applications programs.

Further information: Canon, 1 Hall St, Hawthorn East 3123. Telephone: (03) 20 1331.

Enter K505 on Enquiry Card

Canon conversion

CANON has released a microcomputer backend for its AP400 and AP500 electric typewriters. Connection to a Canon electronic memory typewriter, a disk drive and a visual display unit turns each machine into a word processor. With the same 8088 microprocesor as the Canon AS100 computer, the 16-bit central processing unit uses the industry standard Wordstar program.

Further information: Canon, 1 Hall St, Hawthorn East 3123. Telephone: (03) 20 1331.

Enter K507 on Enquiry Card

Multiprocessor

SYSTEM One, an Australian-produced computer system, is a 64K-byte, Z80, CP/M system. System One software and any CP/M 2.2-based package will run its computers with a selection of 5½in diskettes, 8in diskettes or Winchester hard disks (5, 10, 27 and 54M-bytes). System One computers provide online multiprocessing where up to five terminals and four printers may be employed simultaneously.

Further information: System One, 14/447 Kent St, Sydney 2000. Tel: (02) 267 2388.

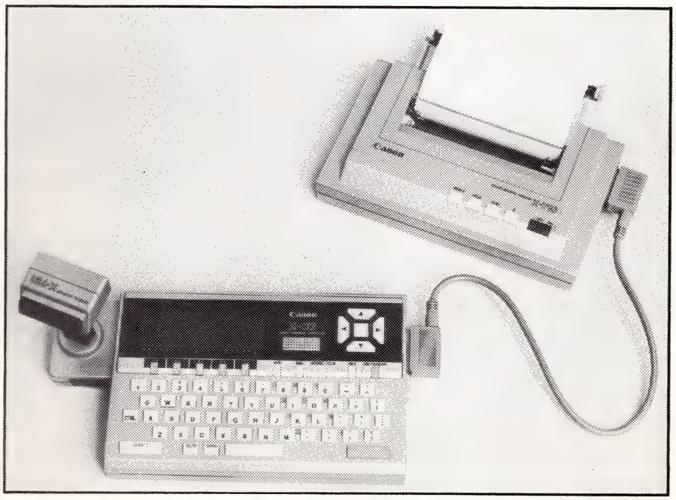
Enter K507 on Enquiry Card

Color graphics

VECTRIX, a high resolution color graphics system released in Australia by Microprocessor Aplications Pty Ltd is priced under $10,000 and offers a pixel resolution of 672 x 480. The complete system comprises an Intel 8088 5MHz internal processor with 1600 nanosecond pixel drawing time, three-color video output with separate and combined horizontal and vertical synch, RS 232 and 8-bit parallel host computer interfaces, alpha-numeric characters with 40 rows of 96 characters on a 5 x 9 matrix.

Further information: Microprocessor Applications, 48 Rutland Rd, Boxhill 3128. Tel: (03) 890 0277.

Enter K508 on Enquiry Card



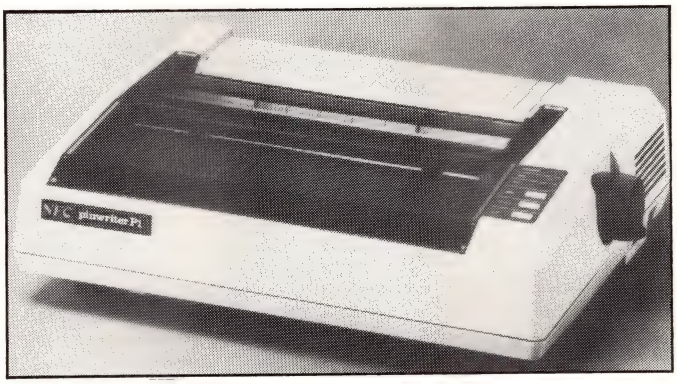
Canon's X-07 personal hand-held computer.

Speed and quality

THE PL series Pinwriter dot matrix printer from NEC, designed for use where multi-mode printing is required for personal computers, OEMs, system integrators and end users requiring high speed and high-quality output. The model PL has an 18-pin 2 x 9 print head, with pins arranged in a staggered array. The Pinwriter's high-speed mode delivers print quality at 180cps, with a high-density mode of 90cps. Print format is selectable for 10 pitch Pica, 12 pitch Elite and 17 Pitch condensed print. Proportional spacing, enhanced print and continuous underline are standard features. Other features include programmable forms control, top-of-form and vertical and horizontal tabs.

Further information: NEC Information Services Australia, 99 Nicholson Street, St Leonards, NSW 2065. Tel: (02) 438 3544.

Enter K536 on Enquiry Card



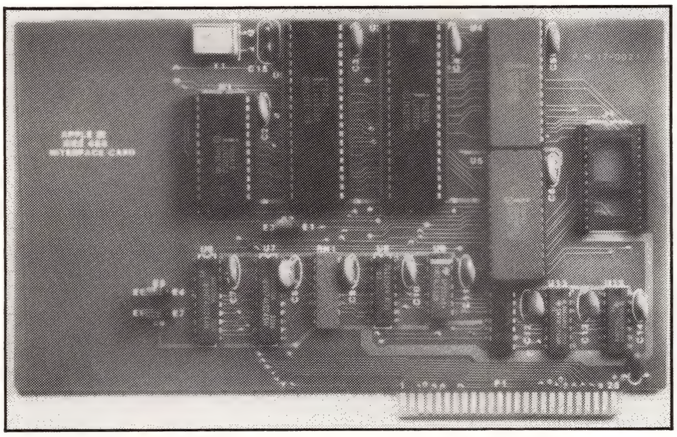
NEC's multimode Pinwriter.

Controller driver

INNOVATED Peripheral Systems has introduced an IEEE-488 controller for the Apple III series. The IEEE-488 controller driver is SOS compatible, allowing the user to employ print or input statements to control bus function. More than 2000 IEEE-488 compatible instruments and other devices can be added to the Apple III. Features include data transfer speeds to 50K-bytes per second and disk containing SOS driver file.

Further information: Mostyn Enteprises, Box 134, Rydalmere, NSW 2116. Tel: (02) 871 6297.

Enter K537 on Enquiry Card



The IEEE-488 bus comes to the Apple III.

Added disk storage

BRISBANE-based Digital Products has released its Winchester disk system DP U80 and DP Q80 series, designed to improve data storage with a new capacity of 69M-bytes expandable to 216M-bytes. This system has a minimum seek time of 5 ms track-to-track with an average seek time of 20 ms. Environmentally sealed media and self diagnostics ensure data integrity and improved system reliability. Other features include interface and formatter on a single quad height card and 1024 byte high-speed RAM buffer.

Further information: Digital Products, 65-73 MacGregor Terrace, Bardon, Qld. 4065. Telephone: (07) 369 7088.

Enter K541 on Enquiry Card

Tektronix color

Tektronix has released the 4105 Color Computer Display Terminal, which provides cost-effective graphics to the technical professional in lowend computer-aided design. UP to eight colors can be displayed at one time on the terminal's 13in screen. The 4105 has a resolution of 480 x 360 pixels and a co-ordinate space of 4096 x 4096 addressable points. The 4695 Colour Graphics Copier uses on-demand ink-jet technology to produce eight-color copies from computer graphics displays.

Further information: Tektronix, 80 Waterloo Rd, North Ryde, 2113. Tel: (02) 888 7066.

Enter K542 on Enquiry Card

350cps printers

AMPEC Electronics has released two 136-column, 350 characters per second printers. The OKI 2410, are high-speed serial dot matrix machines with bi-directional printing, graphics and two-color capabilities, provide a standard font, two condensed fonts and three expanded fonts, allowing handling of subscripts, superscripts and underlines. Other features include: standard parallel interface, offering a choice of Centronics or optional Dataproducts compatibility; 72 x 72 dot graphics which allow duplication of tables; and short-line seeking.

Further information: Ampec Electronics Pty Ltd, 114 Terry Street, Rozelle, NSW 2039. Telephone: (02) 818 1166.

Enter K545 on Enquiry Card

State analyser

NORTHWEST Instrument's Interactive State Analyser (ISA), now compatible with the IBM Personal Computer, provides both data acquisition and post-acquisition processing via Pascal, thereby reducing time and difficulty. It has an advanced, multi-level architecture capable of operating in 15 independent trigger/store states. Storage qualifiers on each state permit local control over state stored data. The ISA features 60 word recognisers and 15 event counters for precise control of triggering, state sequencing and storage. One of ISA's main features is the multiple preview acquisition which not only stores specified, qualified data but also up to seven unqualified data cycles preceding it.

Further information: Northwest Instrument Systems Inc, PO Box 1309, Beaverton, Oregon, USA 97075. Tel: (503) 297 1434.

Enter K547 on Enquiry Card

IDT tape systems

TWO ½in, nine-track, 1600cpi IBM/ANSI/ECMA and ISO compatible magnetic-tape systems from Innovated Data Technology (IDT) utilise the IDT series 1012 Virgo operate at 100ips (streaming) and 12.5ips (start/stop). The tape transport is available in vertical, horizontal or desktop mounting. Features include: 160K-bytes per second data transfer in the "streaming" mode; cover 6500 hours MTBF with diagnostic and self test; IBM and DEC packing in either byte or word transfer. The complete sub-system comes ready for installation and includes coupler, formatter, tape transport, cables and operation/maintenance manuals.

Further information: Mostyn Enterprises, 35 Alexander Street, Dundas, NSW 2117. Tel: 871 6297.

Enter K544 on Enquiry Card

PC interface card

NATIONAL Instruments has released a high speed bus interface model GPIB-PC for the IBM-PC. The interface card provides a complete set of GPIB functions with a minimum number of circuit elements and requires only eight I/O addresses. Data transfer between the GPIB and IBM-PC memory is accommodated by the DMA controller at speeds of 300K-bytes/sec. The software consists of a handler under PC Dos version 2.0 subroutines, an interactive control program, example programs and documentation and a diagnostic program. A standalone software driver is also available for operating systems other than PC Dos.

Further information: Elmeasco, Box 30, Concord, NSW, 2137. Tel: (02) 736 2888.

Enter K543 on Enquiry Card

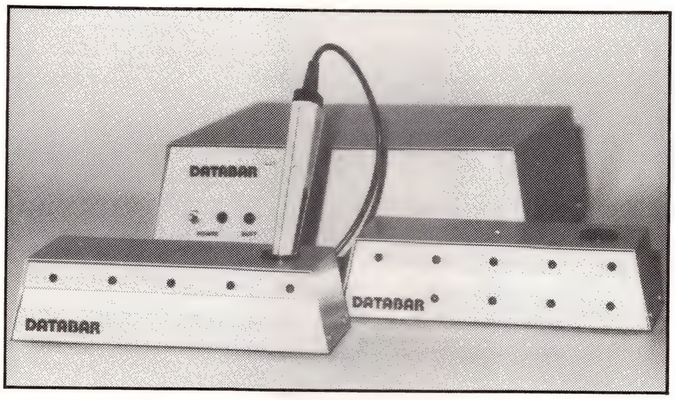
To obtain further details — literature, prices and other information that may be available — for the products described in the editorial columns or from advertisements, enter the number shown at the foot of the item onto the PRODUCT ENQUIRY SERVICE CARD.

Bar code reader

NORTRONIC's new bar code reader, Databar Model 402, with dual RS232 communications, allows easy and flexible connection to most asynchronous serial terminals. All commonly used bar codes are supported, including code 39, interleaved 2 of 5, Codabar and APN. This instrument is totally transparent to computer hardware and software when used with a video terminal. No program changes are needed when a barcode reader is installed and a choice of hand-held wands is available.

Further information: Nortronic Instruments, GPO Box 995, Sydney, NSW 2001. Tel: (02) 290 2844.

Enter K548 on Enquiry Card



Nortronics Databar bar code readers.

Video for Apples

A NEW monochrome video display from Apple is designed to blend with the Apple II family of personal computers. The newly styled monitor features resolution for 80-column text and graphic display, and anti-reflective, high-constrast screen and tilt mechanism for adjusting the screen's angle. The screen displays up to 24 80-character lines of text and high resolution graphics in P31 green phosphor. The monitor is compatible with any Apple II, Apple II-plus or Apple IIe computer.

Further information: Apple Computer Australia, 37 Waterloo Road, North Ryde, NSW 2113.. Telephone: (02) 888 5888.

Enter K549 on Enquiry Card

Versatile graphics

MICROPRISM, a versatile multi-color graphics system, has been released by Australian computer systems manufacturer SME Systems. The S-100 bus system consists of a set of GDC-512 boards connected together through a CMC-100 color palette board, and appropriate software and firmware. Each of the boards has onboard firmware which translates the commands such as DRAW VECTOR, which are then performed by the onboard computer. The graphics are then displayed in a 512 x 490 resolution format on a standard video monitor. A full eight-color card system can choose and display 256 colors out of a palette of more than 16 million colors. The boards are priced at $825 each for the GDC-512 and the CMC-100. A typical eight color system would cost $A3300 excluding tax.

Further information: SME Systems, 22 Queen St, Mitcham, Victoria, 3132. Tel: (03) 429 2977.

Enter K551 on Enquiry Card

Bar code readers

THE Databar models 201 and 202 are the two latest additions to the Australian-designed and manufactured range of bar code readers available from Nortronic Instruments.

These read stations are used with Databar Model 801 Controller to provide low-cost bar code scanning in a factory floor data capture environment. As well as the visible and audible busy, valid read and error signals, the read stations are equipped with four (Model 201) or eight (Model 202) message indicators lit under program control by the computer.

Further information: Nortronic Instruments, Box 995, Sydney, NSW, 2001. Tel: (02) 290 2844.

Enter K552 on Enquiry Card

Low-cost modems

R.F. Computer Communications has introduced a range of low-cost, direct-connect modems. The modems feature an RS232 interface and are available in 300bps and 1200-bps full and half-duplex models. The Shuttle 300, 300bps modem is priced at $A195 for the personal computer market.

Further information: R.F. Computer Communications, 2 Lawson Ave, Frankston, Vic 3199. Telephone: (03) 781 4461.

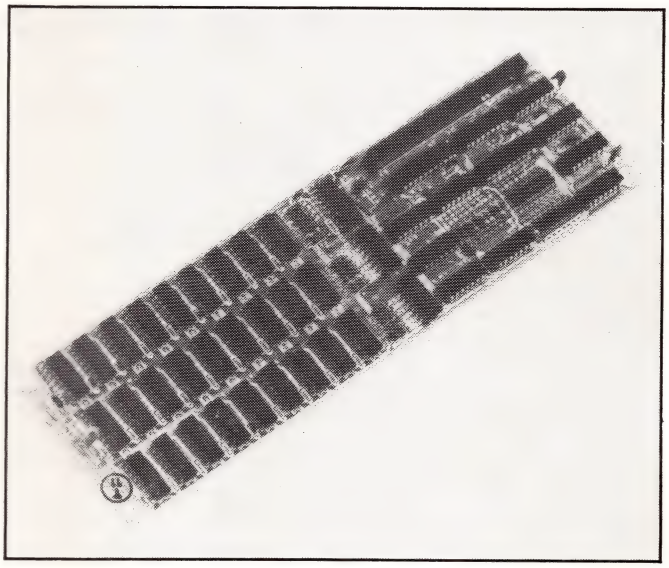
Enter K553 on Enquiry Card

Memory board

DAVONG has released a new 192K memory board for DEC Rainbow users. Priced at $US495 it plugs directly in the Rainbow's connector and gives the computer a total memory capacity of 256K. The memory supports the Rainbow's 8-bit and 16-bit processors, CP/M and CP/M-86 operating systems and all application programs running under these operating systems.

Further information: Imagineering, 579 Harris St, Ultimo, NSW, 2007. Tel: (02) 212 1411.

Enter K550 on Enquiry Card



Davong's Rainbow memory expansion card.

Word processing? SELECT the best!
The only simple thing about SELECT is using it.

Select The EASY TO LEARN, EASY TO USE WORD-PROCESSOR for IBM PC, XT, MS-DOS and most CP/M systems, SELECT IS THE EASY ONE. The full-power, full-feature wordprocessor without that complicated multi-key command system. You type a single key to execute each command, whether it's adding one word or making a complex block move.
Teach On-screen training offers you mastery of your word-processing problems in just 90 minutes — no need to pore over complex manuals.
Help Full HELP instructions available on-screen, even in edit mode.
Superspell Spelling Dictionary, checks and corrects spelling errors. Fast, efficient and EASY to use.
Mailmerging Mass-mailing capability, stores both your form letters and names and addresses. Combine them, update them, use them any time quickly and easily.

All in one package at one competitive price . . . $650 (inc. tax). No shopping for additional software. Dealer enquiries welcome.

select
SELECT INFORMATION SYSTEMS

Australian distributors for select — The Software House Pty Ltd (Inc. in Vic.)
80 Mount Street, Heidelberg, Victoria 3084. P.O. Box 20, Rosanna.
Ph. (03) 459 7877. TLX: 38432 UFIVE ATTN. SOFTWARE.

Enter K069 on Enquiry Card

BMS newsletter

MAKING Business Modeler user friendly on the IBM 4300 series running under DOS/VSE/CICS is just one of the topics discussed in a recent issue of the Business Model Systems (BMS) newsletter, *Business Modeler.* BMS, headquartered in Brisbane, is supported by a network of more than 30 professional organisations in 22 major cities, and invites users, user groups, BMS branches and affiliated groups to submit editorial material for future editions of *Business Modeler.* BMS plans to feature applications and ideas related to the use of Business Modeler/Dataplan software.

Further information: Business Model Systems Pty Ltd, 3rd Floor, 518 Brunswick Street, New Farm, Brisbane, Qld, 4005. Tel: (07) 358 4800.

Enter K525 on Enquiry Card

Power supply

AUSTRALIAN power supply specialist, Scientific Electronics, has just released details of its newest power supply, the SM80AE1. Designed and manufactured to meet Telecom specification 1302, this five-rail switch mode supply offers 80-watt total output and high reliability in a small package at a competitive price. Standard output voltages are available as well as output rails to customer specifications. Total allowable output power is 80 watt continuous 150 watt peak. Isolation is greater than 3.5KV and efficiency greater than 60 per cent full load. The SM80-AE1 measures 108 x 240 x 45mm, as with all other power supplies from Scientific Electronics, it is fully supported by a five-year warranty and complete local technical backup.

Further information: Scientific Electronics, 6 Holloway Drive, Bayswater, Vic, 3153. Tel: (03) 762 5777.

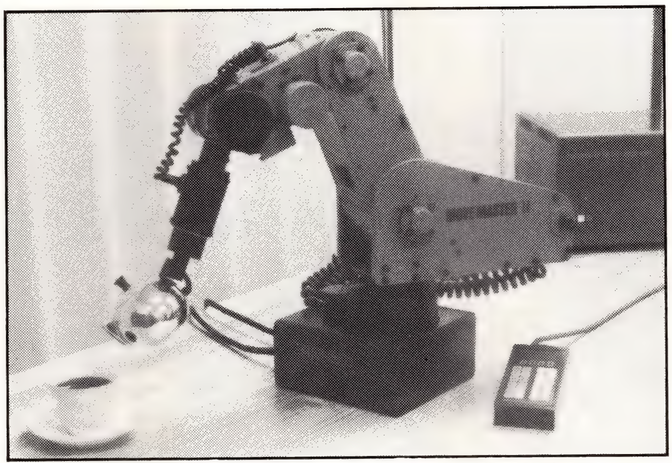
Enter K526 on Enquiry Card

Monitor base

AED Microcomputer Products now supplies a general purpose swivel and tilt VDU monitor base. The unit is rugged and stable and can improve the ergonomics of existing monitors. The base can be used with most popular video monitors.

Further information: AED, 130 Military Rd, Guildford, NSW, 2161. Tel: (02) 681 4966.

Enter K527 on Enquiry Card



The Mitsubishi RM 501 Movemaster II micro-robot.

Mitsubishi robot

THE Mitsubishi RM 501 industrial micro-robot is now available in Australia. The RM 501 is a revolute type robot with six degrees of freedom, range of grippers and a well developed control unit capable of bi-directional interface with a variety of external equipment. The basic unit costs $A9986 (present list price ex tax) and has many industrial, scientific and educational applications. The basic unit consists of the robot body (arm and gripper) and control box. DC servo motors are used for accuracy, repeatability and ease of installation. The standard electronic gripper can be used for a variety of applications or can be replaced by other forms of gripper to suite more specialised applications.

Further information: Intelligent Systems Research, 2/969 Burke Rd, Camberwell, Vic, 3124. Tel: (03) 82 8287.

Enter K530 on Enquiry Card

Davong facts

DAVONG's "Fact-Pack" envelope contains information on a range of its products, including the Winchester hard disk systems, hard disk software, plug-in streaming tape back-up systems and Multilink local area network. Selection of the appropriate host adapter, interfacing cable and software permits use of the company's universal Winchester had disk system, with IBM PC and XT, Apple II, IIe and III, Osborne I and compatible computers. Davong is a supplier of local area networking solutions, hard disk sub-systems, and back-up sub-systems.

Further information: Imagineering, 579 Harris St, Ultimo, NSW, 2007. Tel: (02) 212 1411.

Enter K528 on Enquiry Card

K-tel offers games

K-TEL has entered the video cartridge business with the XONOX double-ended cartridge. Each cartridge contains two games, one at each end, and is available for Atari and Vic 20 computers. K-tel will market the games using television.

Further information: K-tel, 46 Pyrmont Bridge Rd, Pyrmont, NSW, 2009. Tel: (02) 660 0011.

Enter K529 on Enquiry Card

Cruise control

THE Zemco range of car computers has been expanded to include a deluxe model cruise control. The new model, the Cruise Computer, also incorporates a display showing driving time, distance travelled and vehicle speed. The advantages of cruise control are: more accurate speed control, reduced driver fatigue, improved economy, prevention of accidental speeding and precise speed tuning for traffic flow. The Zemco range now includes three cruise controls and four trip computers. Prices for the range start at $A160 and rise to $A340 for the top-of-the-line Compucruise Model 44.

Further information: Antelope Automotive, 75 Military Rd, Neutral Bay, NSW, 2089. Tel: (02) 909 2155.

Enter K531 on Enquiry Card

Tandy newcomers

TANDY has released its 1983 Computer Catalogue which includes five new microcomputers: TRS-80 Model 12, TRS-80 Model 4, TRS-80 Model 100, PC-4 Pocket Computer, and MC-10 Micro Computer.

Further information: Tandy, 91 Kurrajong Ave, Mt Druitt, NSW, 2770. Tel: (02) 675 1222.

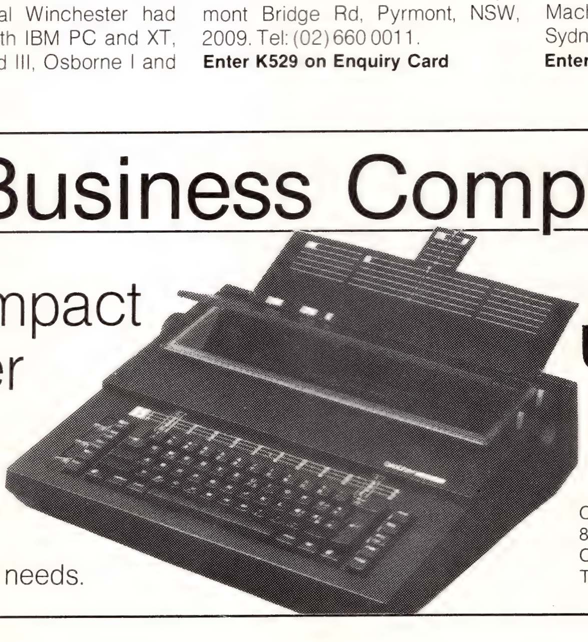
Enter K532 on Enquiry Card

Bigger calculator

SANYO Office Machines has released the XC 2630 personal calculator. The calculator is solar powered and has a large digital display and full-size numeric keyboard. The product has been developed in response to complaints about the trend to miniaturisation of keyboards and display units. Sanyo also released a new range of cash registers at the Melbourne Business Efficiency Fair. The cash registers are equipped with an Inter-Register Communication (IRC) interface that enables them to communicate with other registers and computers.

Further information: Sanyo Office Machines, 127 Walker Street, North Sydney, NSW, 2060. Tel: (02) 929 4644.

Enter K533 on Enquiry Card



Caulfield Business Computers

Lightweight, compact electronic printer

The Brother CE-60 electronic typewriter has full interfacing capability with most micro-computers. To meet your future office and computing needs.

brother.
CE-60

Caulfield Business Computers
874 Glenhuntly Road,
Caulfield South, Vic 3162.
Telephone (03) 528 4555.

Enter K027 on Enquiry Card

Access to rainbow

DEC has released two communications programs that will allow Rainbow 100 personal business computers access to IBM mainframe computers. The packages, Poly-BSC/RJE and Poly BSC/3270 are members of the same family of products which allow communication between the Rainbow and all DEC's mainframes. Poly BSC/RJE allows the Rainbow 100 to emulate the IBM 2780 data transmission terminal and the IBM 3780 data communications terminal using a subset of the binary synchronous communications protocol. Poly BSC/3270 allows the Rainbow 100 to emulate various members of the IBM 3270 information display system.

Further information: DEC, Railway Plaza, Railway Parade, Chatswood, NSW, 2067. Tel: (02) 412 5268.

Enter K509 on Enquiry Card

Case networker

CASE Communication Systems has introduced its first local area networking product. Called the Prontomux, Case claims it provides a low-cost method of interconnecting terminal and computer equipment over distances up to 2000 feet. The Prontomux will multiplex up to 8 asynchronous channels on to a twin twisted pair cable, providing dramatic savings in inhouse cabling costs. The Prontomux is less than $A1000 for an eight-channel unit.

Further information: Case Communication Systems Ltd, 1-3 Rodborough Road, Frenchs Forest, Sydney, 2086. Tel: (02) 451 6655.

Enter K511 on Enquiry Card

Discovery link

ARCHIVES Computers has just announced the availability of local area networking for its multiuser microcomputer system — the Discovery Multiprocessor. Up to 10 Discovery systems may be linked without the use of repeaters via a low-cost party line. The DPC/Net is accomplished through the use of the group's high-speed serial interface card called the DPC-SIO, which supports the SDLC communications protocol. Network information is transmitted throughout the party line using the RS422 interface. This interface allows maximum cable lengths of 400ft (at 800K-baud) up to 4000ft (at 100K-baud).

Further information: Archives Computers, 163 Clarendon Street, North Melbourne, Vic. 3205. Tel: (03) 699 8377.

Enter K512 on Enquiry Card

Versatile card

TOPOLOGY Network has developed a communications card with versatile features. The card is available for the IBM Personal Computer, and has a Z-80 processor supporting the communications controller. Support for communication is with asynchronous, bisynchronous, SDLC or HDLC. The card supports IBM 3780, 3270, 3770, 3274 and ICL C01, C03 and X25. The board contains 64K-bytes of RAM and four serial I/O ports, compatible with IBM programs.

Further information: HAL Computer Products, PO Box 2306, Richmond, Vic, 3121. Tel: (03) 429 5796.

Enter K513 on Enquiry Card

Processor from TI

A LOW-cost communications processor supporting both bit-oriented and character-oriented protocols at speeds up to 9600 bits/sec has been introduced by Texas Instruments Inc for its Business System 600 and 800 computer systems. The processor is designated CP502. It allows communications among TI business systems and between them and computers from other manufacturers.

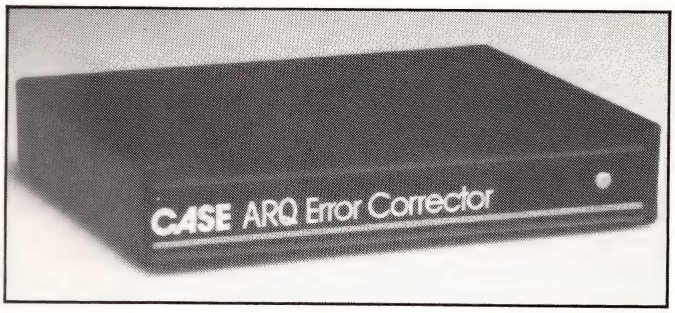
Further information: Texas Instruments, 6-10 Talavera Rd, North Ryde, NSW, 2113. Tel: (02) 887 1122.

Enter K514 on Enquiry Card

Austpac support

SUPPORT for the attachment of IBM communications products to Telecom's Austpac Packet Switched Network was formally announced by IBM Australia last week. This follows extensive testing in Australia of the IBM X.25 communications support for products such as the visual display unit, communicating Personal Computer and Displaywriter, and finance industry terminals, to assure the effective operation of IBM systems in the Austpac environment.

Error corrector



CASE Communication Systems has introduced its first data communications product developed completely in Australia. Called the ARQ, it is a data communications error corrector. Designed for use on data links connecting remote VDUs, printers, graphics terminals, micros and computer systems the ARQ provides protection against data loss and corruption caused by errors induced on the transmission link. Case Communication Systems has also introduced a new high speed multiplexor called the Kilomux, which will operate on digital and analogue transmission media at speeds up to 72K-bits/sec. Three built-in composite link interfaces handle all interface types — V11, V25, V35, X21 bis, RS 232C, RS 422.

Further information: Case Communication Systems, 1-3 Rodborough Rd, Frenchs Forest, NSW, 2086. Tel: (02) 451 6655.

Enter K510 on Enquiry Card

Short haul modem

A NEW mini modem which connects directly to the interface has been introduced by data communications specialist Datacraft. The RAD SRM-6 short haul modem is a full duplex asynchronous data set, operating over unconditioned telephone lines from 4km at 192,000 bits/sec up to 35km at 1200 bits/sec on varying gauge cables. Datacraft has also released the TLSI, a low-cost unit which allows up to two, four or eight terminals to share one modem or CPU port. The TLSI is transparent to data and operates asynchronously or synchronously at data rates up to 19K-bits/sec. Prices are two channel $A577, four channel $A827 and eight channel $A1430.

Further information: Datacraft (Aust), PO Box 353, Croydon, Vic, 3136. Tel: (03) 726 9911.

Enter K516 on Enquiry Card

To obtain further details — literature, prices and other information that may be available — for the products described in the editorial columns or from advertisements, enter the number shown at the foot of the item onto the PRODUCT ENQUIRY SERVICE CARD.

MICRO COUNTRY PTY LTD
332 Burwood Road, Hawthorn.
Vic. 3122. Phone (03) 818 7152.
Open late Friday night and Saturday mornings.

128K
4MHz
Z80A processor standard
PIPS Data management tool
Arithmetic processor standard
IBM 3270, 3780, 2740, 3740 emulators
MS DOS via softcard option

The SORD M23 is a proven work horse that can provide you with all the facilities of of many more expensive computers.

At MICRO COUNTRY we have connected a SORD M23 to a FACOM mainframe and WE generated the software on the FACOM! We know mainframes as well as micro computers!

FAX-80 printers	$570.00
Commodore 64	$499.00
Games for C-64 from	$19.95

Enter K059 on Enquiry Card

Modeller package

FOLLOWING hot on the heels of its micro-based financial modelling system, Micromodeller, Intelligence (Aust) announces its Modeller 16 package, designed to operate on a range of micro and personal computers including IBM, Sirius and DEC. The new system is designed for experienced computer professionals so that basic programming methodology can be utilised in the application of the system. Modeller's built-in logic enables the user to construct IF-THEN-ELSE commands — previously defined logic can be stored and is available for automatic look-up and insertion. Other facilities include GO TO and indirect addressing commands which enable models to automatically process data based on predetermined logic sequences.

Further information: Intelligence (Aust) Pty Ltd, 4th Floor, 204 Clarence Street, Sydney, NSW, 2000. Tel: (02) 29 5431.

Enter K569 on Enquiry Card

Wordplus-PC

SCA's word processing package, Wordplus-PC, designed specifically for the IBM Personal Computer, uses of the 10 function keys on the IBM keyboard. The package includes colorful adhesive key-cap labels which enables the IBM PC to be operated as a word processor. The key caps means the user does not have to commit to memory long lists of code sequences. Wordplus-PC functions include global search-and-replace, cut-and-paste, three-line headers and footers and automatic page numbering.

Further information: Software Corporation of Australia, 449 Swanston Street, Melbourne, Vic, 3000. Tel: (03) 347 7011.

Enter K570 on Enquiry Card

EZ spelling check

LANIER's EZ-Spell, a spelling verification disk option for its EZ-1 work processor, allows operators to check spelling automatically, eliminating the need for manual proofreading. EZ-Spell has an 88,000-word dictionary which is electronically filed as compressed data on a diskette. An extra 6500 words, such as technical and business terms, place names and surnames, can be added to each dictionary disk. Verification is done in the background which means the user can continue using the keyboard for other tasks. EZ-Spell prints out a hard copy of the proofread text before the text has been corrected, allowing the typist to continue the next assignment while the originator makes corrections on paper.

Further information: Lanier (Australia) Pty Ltd, 296 Burns Bay Road, Lane Cove, NSW, 2066. Tel: (02) 428 1233.

Enter K571 on Enquiry Card

Second generation Farmplan for Apples

FARMPLAN has released a second generation of its agricultural software (financial, arable, dairy and pig production programs) for the Apple II microcomputer. The new range is designed so that any entry is made only once — the program then automatically adjusts the relevant records in other affected areas. Every screen display carries the number of the relevant page in the documentation, which promotes rapid training and fault-finding. The core of the system, the financial program, includes full supplier, customer ledgers and inventory control and the coding system allows any business to set up and name its own code. Multifarm analysis is also available. Gross margins and analysis of enterprises is fully developed with automatic adjustment for the value of stocks. The enterprise programs extend the concepts of the original Farmplan programs and are linked to the financial program through both the budgets and stock control.

Further information: Farmplan, PO Box 1375, Orange, NSW, 2800. Tel: (03) 62 5311.

Enter K568 on Enquiry Card

Form management

A FORM management system ISIS, from Robert Johnson Associates, is designed for a wide range of computers, and consists of a sub-routine library for performing formatted screen input, as well as a powerful editor and librarian to aid the development of screen layouts. The form library files are machine and terminal independent, thus achieving a high level of portability. Versions are available for Digital, Prime, Data General and Wicat computers. ISIS is suited to organisations developing large software systems.

Further information: Robert Johnson Associates, 52 Clarence Street, Sydney, NSW, 2000. Tel: (02) 29 7153.

Enter K572 on Enquiry Card

Link to mainframe

A NEW software package from Intelligence (Aust), called Linkline, converts a range of micro and personal computer systems into intelligent terminals for use in a mainframe-based time-sharing system. Initially Linkline was compatible only with Apple II but now can be used on Sirius, IBM and Osborne personal computers.

Further information: Intelligence (Aust) Pty Ltd, 4th Floor, 204 Clarence Street, Sydney, NSW, 2000. Tel: (02) 29 5431.

Enter K573 on Enquiry Card

OPAL accounting

COMPUTER Benefits has announced a microcomputer-based multi-user accounting system which is integrated into the ICL mainframe computer environment. Written for ICL's Personal Computers and DRS range of distributed multi-microcomputer systems, the software intitially comprises applications for online order entry, creditors, debtors, general ledger and stock control. OPAL, standing for Order Processing and Ledger, was developed in Australia by Computer Benefits in co-operation with Alternative Systems Ltd of the UK. The minimum configuration of an ICL Personal Computer required to run OPAL is priced at about $A7000 and would be based on a PC15. However, an average installation will probably cost about $15,000 and include a PC, hard disk, printer and two visual display units. Running on a DRS system, OPAL needs at least one hard disk in the local area network.

Further information: Computer Benefits, 41-61 Cecil Street, South Melbourne 3205. Telephone: (03) 699 1633.

Enter K574 on Enquiry Card

Mite distributor

TRANSNATIONAL Data Corp has been appointed Australasian distributor of the new Mite package for microcomputers running under CP/M. Mite, menu-orientated with a number of user protection features, is intended for use in four primary applications: accessing online time-sharing system; accessing online CP/M systems (RCPM) and bulletin board systems; file exchange with other CP/M microcomputer systems; and accessing TWX or other store and forward systems. All communication parameters specific to a given site can be selected via the menu options, then saved on a "parameter file" for future use. Mite's user-protection feature helps prevent accidental loss of captured data or disk files.

Further information: Transnational Data Corp, PO Box 76, St Leonards, NSW, 2065. Tel: (02) 439 6533.

Enter K575 on Enquiry Card

Medical system

MEDICAL Computer Consultants is distributing a medical accounting and reporting system developed by Fletcher DP Services based on its earlier radiology package. The system provides a patient-management system for any CP/M-compatible environment.

Further information: Medical Computer Consultants, 11/285 Carlisle St, Balaclava, Vic 3183. Tel: (03) 527 3443.

Enter K576 on Enquiry Card

Magic's advantage

LEADING Edge Designs has released Magic, a set of assembly language sub-routines designed as an interface between the North Star Advantage graphics manager and Microsoft Basic. It allows graphics to be generated simply and quickly within Basic in the interpreter or immediate modes. Magic includes all the features of the newest release of the Advantage graphics manager, which allows rotation of rectangles and ellipses and it works with the older graphics manager and with any of the North Star CP/M versions. The system supports input from a digitiser pad and has graphics screen dump drivers for Microline and Epson printers.

Further information: Leading Edge Designs, 4 Forrest St, Seaview Downs, 5049.

Enter K577 on Enquiry Card

Data retrieval

MICROTRIEVE, a retrieval program for microcomputers developed by The Automated Office, is designed to search data files and extract, sort and print information requested. Microtrieve will access databases and obtain information and an ad hoc basis, write reports, and design report formats. It allows alterations to descriptions of data and is an interactive program. Language is based on everyday English and data descriptions are independent of the stored data.

Further information: The Automatic Office, PO Box 490, Chatswood, NSW, 2067. Tel: (02) 411 1892.

Enter K578 on Enquiry Card

Packages bundled

ADAPTIVE Electronics, one of the distributors of Cromemco in Australia, will bundle MicroPro's Wordstar, Infostar and Calcstar applications packages with Cromemco's popular C-10 personal computer.

Further information: Adaptive Electronics, 418 St Kilda Rd, Melbourne 3000 Tel: (03) 267 6800.

Enter K580 on Enquiry Card

Oil, fuels system

AN integrated computer system for control of orders, invoices, customers, and stock to distributors of oil and industrial fuels has been announced by AWA and Excalibur Management Consultants. The software, developed by Excalibur, operates on the Micromax range of microcomputers and the Reality and Sequel range of business systems. The system is totally menu-driven, and flexibility allows it to accommodate reporting and processing requirements unique to various businesses. Passwords protect sensitive data in the system.

Further information: AWA Data Processing Systems Division, 8th Floor, 132 Arthur Street, North Sydney, NSW, 2060. Tel: (02) 922 3300.

Enter K589 on Enquiry Card

WP package

ALFATRON has just started to distribute the T/Maker software package from T/Maker Co in California. This package is available for CP/M-80 and CP/M-86 and several other operating systems. T/Maker is an integrated package that can be used for word processing, as a spreadsheet calculator, bar charting, file management, list sorting and tallying. It allows manipulation of words, numbers, lists singly or all at once.

Further information: Alfatron, 1761 Ferntree Gully Rd, Ferntree Gully, 3156. Tel: (03) 758 9000.

Enter K562 on Enquiry Card

Cromemco Lisp

LISP, a software language for database applications and manipulation of mathematical expressions for Cromemco users, has been released in Australia by Insystems Pty Ltd. The language can be used on 8, 16 and 32-bit computers, and can be used for programming intelligent controllers, robots, computer-aided design and design automation. The Lisp program is available on both 5¼in and 8in diskettes from Insystems.

Further information: Insystems, 337 Moray St, South Melbourne 3205. Tel: (03) 690 2899.

Enter K563 on Enquiry Card

APL processor

An extended APL language processor, APL*Plus/PC system, developed for the IBM Personal Computer, has been released by Sourceware Pty Ltd. The APL*Plus/PC system contains all APL language primitives, special features for the small computer environment and most of the proprietary enhancements of the developer of the system, STSC Inc. The IBM-PC hardware configuration requirements to run the APL*Plus/PC system are few — at least 128K-bytes of CPU RAM memory, at least one disk drive and either of the IBM monitor adapters. The APL*Plus/PC system package includes a diskette containing the APL language processor, a custom character ROM to generate the APL characters and documentation.

Further information: Sourceware, 4/73 Albert Ave, Chatswood 2067. Tel: (02) 411 5711.

Enter K564 on Enquiry Card

Tektronix support

TEKTRONIX Information Display Division support for GKS, the Graphical Kernel System, in its Plot-10 library of graphic software development tools. The GKS draft standard document includes a Fortran language binding to ensure device independence. Plot-10 GKS supports full GKS capability, through level 2B, as defined by the draft standard document. The package supports 2-D graphics functions, color panel filling, graphic segments capabilities, software text fonts, direct and bundled control of primitive, graphical and non-graphical input, as well as the fundamental workstation concepts addressed by GKS. The average configuration price for a complete GKS package in Fortran 77 source code, including input and output routines and media is $11,500. OEM discounts are available.

Further information: Tektronix Australia Pty Ltd, 80 Waterloo Road, North Ryde, NSW. Telephone: (02) 88 7066.

Enter K565 on Enquiry Card

Fletcher trio

FLETCHER DP Services Pty Ltd has released three new vertical market software packages. This bring to seven the number of packages released since the company began in January, 1981. The packages include SCCP, a superannuation contribution calculation program which performs calculations in accordance with Federal Government guidelines and prints the results in a form suitable for submission to the taxation office with returns. PUBS is a comprehensive publishers subscription system to keep track of subscribers. It also provides detailed statistical analysis of subscribers' profiles and sorts mailing labels to the Australia Post standard. POMS is a professional organisation membership system. It provides complete information management to any member-based organisation.

Further information: Fletcher DP Services, 11/285 Carlisle St, Balaclava 3183. Tel: (03) 527 3443.

Enter K566 on Enquiry Card

Electronic filer

GPW Software Options has announced a new electronic filing system, the ELFI/PC package. The ELFI/PC package can be utilised by the IBM/PC and XT under both releases of MS/DOS and works on other IBM-compatible equipment. It is also being prepared for compatibility with the Wang/PC and should be released in a couple of months. The system allows organisation or re-organisation of record keeping, archival material, accounts, billing and mailing lists, with the unique Elfi file organisational facility based upon grouping of up to nine files simultaneously.

Further information: GPW Software Options, 504/127 York St, Sydney 2000. Tel: (02) 267 1788.

Enter K567 on Enquiry Card

Software Solutions

Can you develop a menu-drive, interactive data entry, update and reporting system (in MICROSOFT BASIC) for your micro in

20 MINUTES?

We can . . . . . . with

NUCLEUS

Call us. We'll show you real programming tools!

AMERICAN EXPRESS
Cards Welcome

bankcard
welcome here

Software Solutions (Australia) Pty Limited
(Incorporated in New South Wales)
Visionhire House, 144 Pacific Highway, P.O. Box 624, North Sydney, 2060.
Phone: (02) 92 0603 Telex: 72618

Enter K029 on Enquiry Card

Occidental underwriting goes online

OCCIDENTAL Life, well known for its innovative design and marketing services, has virtually eliminated its underwriting paperwork by putting all new business processing online, resulting in much less paperwork, speedier processing, faster policy changes and a more efficient service for policy holders. The new online underwriting system operates on the company's recently acquired IBM 4341 Model Lil computer and is the first step in a revised administrative system the company has called its "Blue Ribbon Service". Online underwriting has been introduced through the company's application of the Australian-designed CLOAS insurance administrative software. The new processing system allows underwriters to input and store new policy application details and retrieve progressive application status information.

Hotel/motel service

A JOINTLY developed videotex-based national hotel/motel reservation serviced called Roomservice is to be launched by Control Data and Bass Communications. The Service, which will be delivered on Control Data's Cybertel videotex, will have wide appeal to large hotel/motel chains and tourist accommodation and convention establishments. Entertainment, sporting events and leisure activity tickets also may be booked via the reservation system.

Further information: Control Data Australia, 493 St Kilda Road, Melbourne, Vic, 3004. Tel: (02) 268 9500.

Enter K522 on Enquiry Card

Grinding range

THE full range of Jones & Shipman precision surface, cylindrical and tool and cutter grinders, as well as honing equipment, is now sold and serviced throughout Australia by John Hart. Jones & Shipman has a large established customer base in Australia and new models including CNC and microprocessor-based grinders will soon be available. The new range complements John Hart's existing range of larger surface grinding machines, which provides the company with a high degree of specialisation in all facets of precision grinding.

Further information: John Hart Pty Ltd, 7 Winterton Road, Clayton, Vic, 3168. Tel: (03) 543 2433.

Enter K523 on Enquiry Card

Terrain plot

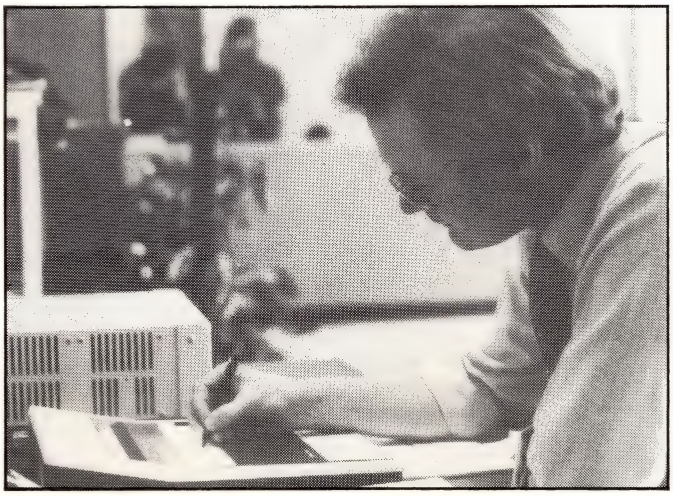
KINGDOM's computer package Mastertrace, designed to provide a wide variety of digitising facilities allowing digitised plans to be replaced at varying scales, is being used by Dillingham Construction for reconstruction of 140km of highlands road for a south-east Asian goverment. The complexity of the work requires a detailed ground survey to be undertaken before and after the project is completed to enable cross-sections to be plotted, identifying different sub areas per cross-section. Sub areas are catagorised by color coding from cross-section to cross-section and then digitised by computer. The program can be used for digitising any type of planimetric detail such as houses, land parcels, contours, natural features or engineering quantities.

Further information: Kingdom Pty Ltd, PO Box 338, Ryde, NSW, 2112. Tel: (02) 807 4822.

Enter K524 on Enquiry Card

Claims speeded

INSTALLATION of Progeni Systems' Lineshare has helped speed claims payments at the Victorian Insurance Office Employers' Liability Department. A communications controller for use with hand-written data entry systems, Lineshare helped eliminate the department's nightly routine of batch-processing key punch data from claims documents by enabling direct communication between the Micropad terminals and the department's B3845 computer. Built around the Intel 8085 multibus system the Lineshare controller effectively operates as a multiplexer, allowing up to 16 Micropads to communicate with a host computer via a single polled line. In the SIO installation, Lineshare communicates with the B3845 via an RS 232/TD1 converter by emulating a TD830 terminal using standard Burroughs Poll/Select protocol. Communications from the Micropads to the Lineshare controller is by standard EIA RS 232C interface.



Micropad terminal in use on Progeni Lineshare system.

City on an Apple

THE Brisbane Visitors and Conventions Bureau is using an Apple IIe to store information about major attractions and services such as restaurants, sporting facilities, accommodation, movies, shops, travel agents, banks and government departments on Apple IIe diskettes. Visitors to the information booth in the centre of the city can tell the service operator the type of attraction they are looking for, and the operator then guides the Apple IIe through menus to list on the screen or printer the information required. The bureau is working to improve the program with animated graphics and hopes to connect the Apple to a video monitor so films of attractions can be shown.

CSIRO rebuild

DIGITAL Products, Brisbane, has rebuilt CSIRO's Division of Fisheries computer system, turning it from a single-user system into an efficient 15-user system for far less the cost of a comparable computer. The rebuild plan was done in two stages. The first stage included a PDP-11/03 computer system with 64K-bytes of memory, two diskettes and a user terminal. This hardware, together with an interactive computer program, meant the research lab could make detailed studies of prawn larvae distribution and abundance in the Gulf of Carpentaria. Stage two of the rebuild included a PDP-11/23 computer system based on a 20M-byte Winchester disk drive with 256K-bytes of memory and a TSX operating system. The Prawn Research Lab is now able to classify material on the prawn larvae more accurately and information will be used to research the problem of yearly fluctuations in prawn catchments in certain areas. A third stage is planned for 1984.

Further information: Digital Products, 65-73 MacGregor Terrace, Bardon, Qld, 4065. Tel: (07) 369 7088.

Enter K521 on Enquiry Card

Agents warned

EVEN discounting the computer criminal as such, anyone with a home computer is a potential technology trespasser who can cause real hardships, not only tampering with computer systems via telephone lines, but by simply clogging up the machine or communications network attached to it, said Eracom president Dr Bill Caelli at a recent conference of Australian Federation of Travel Agents in Sydney. Dr Caelli's warning coincides with an increasing interest in computer systems by the travel industry, and he aimed to "scare" conference delegates into recognising the ways in which computers may be compromised, particularly through wire-tapping techniques. Dr Caelli stresses that "reasonable safeguards must match a reasonable assessment of vulnerability", pointing out that awareness is the best safeguard.

Further information: Eracom, 133 Alexander Street, Crows Nest, NSW, 2065. Tel: (02) 439 5488.

Enter K517 on Enquiry Card

Work costing

BROWN, Quee Pty Ltd, an international work measurement consulting practice, has released Workfile as a complete work measurement service, or as a leased inhouse system with external technical support. The computer system is based on the Modapts (Modular Arrangement of Predetermined Time Standards) technique, which allows activities to be developed in blocks. Work standards set by a system other than Modapts can also be incorporated into the system, but later blocks are added according to the Modapts technique. Workfile will be of immediate interest to banks, insurance companies and building societies which need to keep close track of internal costs. It will also be of interest to companies which need to calculate and allow for indirect labor costs.

Further information: Brown, Quee Pty Ltd, 18/618 St Kilda Rd, Melborne, Vic, 3000. Tel: (03) 51 1949.

Enter K519 on Enquiry Card

Fluid analysis

THE Manukau City Council, New Zealand, has taken delivery of Kingdom's design software suite Masterpipe #2, which is designed to allow the engineering department to analyse and design the city's water reticulation system. The package will be used on the council's Hewlett-Packard 9836 computer. Masterpipe #2 permits complex fluid networks to be computed in seconds instead of hours by manual methods, and is a true 3D numeric computation tool. It is also used in the design of hydraulic services in building and industrial installations.

Further information: Kingdom Pty Ltd, PO Box 338, Ryde, NSW, 2112. Tel: (02) 807 4822.

Enter K520 on Enquiry Card

Zilog 32-bit chip

A NEW 32-bit microprocessor that offers on-chip cache and memory management and can execute up to 5 million instructions a second has been released by Zilog Inc. The Z80,000 CPU is a true 32-bit device in all respects, and features full 32-bit architecture and implementation, a complete 32-bit instruction set, 32-bit internal and external data paths, full support for all 32-bit data types and its chip is fully compatible with the Zilog Z8000 CPU family. The chip has four 4G-bytes of directly addressable memory, and features three selectable modes of address representation: 32-bit linear, 32-bit segmented and 16-bit compact. Designed for clock speeds ranging from 10 to 25Mhz, the chip can operate as fast as one instruction per processor cycle. The production process yields an NMOS chip with 2-micron geometries, which packs nearly 150,000 transistors on the Z80,000 chip. Samples of the Z80,000 CPU, housed in a 68-pin Jedec B leadless package, will be available in the second quarter next year. Production quantities will be priced at $US150 in 1000-unit lots.

Chip security

INTEL Corp is making the erasable PROM version of its 8051 single-chip microcontroller in its high-performance NMOS technology — HMOS (high-performance metal oxide semiconductor). The new version, called 8751H, exactly matches the 8051AH's architecture and speed. It is used primarily for prototyping and early production of systems based on the 8051. The 8751H provides software security. Once a program is developed and final, a security bit can be programmed to make it virtually impossible to access the internal program. This capability is critical for protecting proprietary software from unauthorised examination and copying.

Step towards 3-D

A CHIP claimed to be the world's fastest SOI structure metal oxide semiconductor has been released in Japan by the Mitsubishi Electric Corporation. With a delay time of only 280 picoseconds (one picosecond is one billionth of a second) the chip is four times faster than a conventional SOI device and even faster than a device using a single-crystal silicon wafer. Manufactured on an experimental basis using a laser beam recrystallization technique, the new chip is claimed to be a major step toward the realisation of three-dimensional integration. To make a 3-D integrated circuit, it is necessary to cover integrated circuits (ICs) on every tier of the multiple layers with oxide or nitride film for complete electrical insulation, and to place a single crystal of silicon on top of this film for the next ICs. Transistors and other devices are integrated on the surface of single-crystal silicon in conventional ICs. In the case of the SOI-structure IC, single-crystal silicon is formed on an insulator substrate like silicon oxide.

Further information: Nexus Electronics, 339 Pacific Highway, Crows Nest, NSW, 2065. Tel: (02) 922 1722.

Enter K534 on Enquiry Card

D language on way

ACE Microsystems Ltd of London has been developing the high productivity decision table programming language D for about two years and its first phase of development is already bearing fruit. Its syntax is similar to Filetab and RPL but is claimed to be considerably more advanced. D is a multilevel language with high level facilities for productivity, and low level features for a wide scope of application. It exploits a two dimensional or visual approach to programming. It shows physical relationships in pictures and logical relationships in tables. The first goal was to compile the technologically advanced LEX-11 database and word processing package. This was accomplished in February last year. Since July last year all development of LEX-11 has been done in D and the first general release of the D version of LEX-11 (8A9) is in progress. LEX is a large and complex program of 10,000 lines. D, and therefore LEX, have already been ported to the C Itoh M68000 with a Wicat version following soon. A 8086 version of LEX is expected soon and this will make LEX available on the DEC Rainbow and later on the IBM Personal Computer.

Further information: General Systems, 18 Thomas St, Chatswood NSW, 2067. Tel: (02) 411 2460.

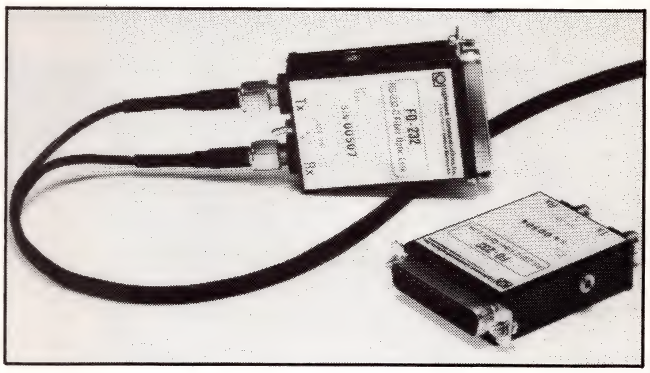
Enter K535 on Enquiry Card

Intel's Xenix move

INTEL Corporation has introduced the Xenix 286 operating system for its iAPX 286 line of microprocessors and board-level products. The Xenix 286 is a multitasking, multiuser microprocessor derivative of Western Electric's Unix Version seven operating system, targetted primarily to high-performance commercial original equipment manufacture applications. Xenix is also available on Intel's 8086 16-bit microprocessor components, board-level products and systems. Intel customers with software developed under Xenix on the 8086 microprocessor can easily transport that software to 80286-based systems. Xenix for the 80286 supports the new Intel 80287 mathematics processor, automatically providing fast floating-point arithmetic. Intel also intends to provide its OEM customers with a full range of standard microcomputer system building blocks by working with Western Electric to develop a port of that company's Unix System V operating system for the Intel iAPX 286 microprocessor.

The fiber optic link you've been waiting for.

FO-232



The **FO-232** is a fully duplex optical modem designed for the tranmission of asynchronous data via fibre optic cable.

The **FO-232** completely plug to plug compatible with existing RS-232C 25-pin connectors meeting EIA RS-232C and CCITT V.24.

The **FO-232** is capable of transmitting data up to 2 kilometres at 100Kb/second.

The predetermined fibre optic cable is immune to electrical interference and is small in size and weight.

Low cost — easy installation.
No fibre optic experience necessary.

OTHER FIBRE OPTIC SYSTEMS
INTER-LINK series for process control signals.
4-20ma and 0-10Vdc.
Series 8211 high resolution video links.

DC DATA CABLE

DATA CABLE PTY LTD. (Inc in Vic)
Cnr Croydon & Lincoln Roads, Croydon,
Vic 3136 Australia.
Telephone: (03) 725 0933. Telex: AA35834.

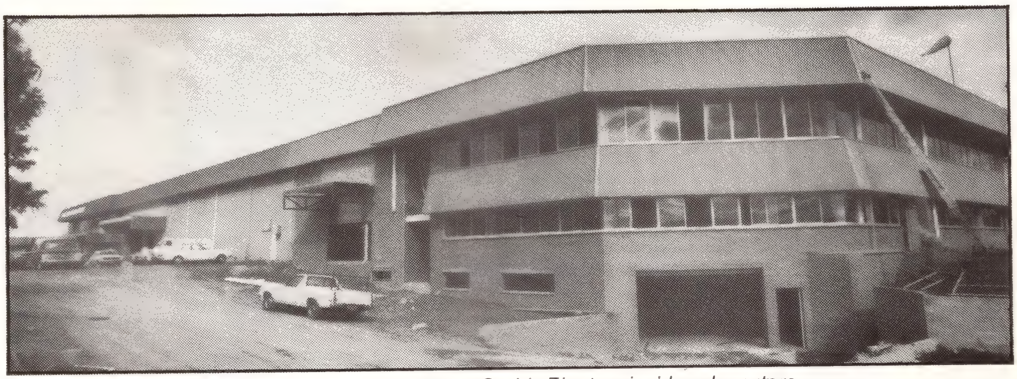
Enter K061 on Enquiry Card

And a helipad

EXTENSIONS and remodelling costing more than $A2 million to the Dick Smith Electronics headquarters at North Ryde, Sydney, NSW have increased space from 50,000 sq ft to 85,000 sq ft. Other features include a new staff recreation area overlooking the staff swimming pool, barbecue facilities, and Dick's helipad.

Supplier to PS

LEXINGTON Data Corp of North Sydney has been appointed as a supplier to the NSW Public Service of an extensive range of microcomputer systems in various configurations through to very large, multiuser systems. Their primary tasks are in widely varied government accounting procedures and in new financial control and administration areas.



Extensions under way at Dick Smith Electronics' headquarters.

Lisa here in volume

THE first volume shipments of Lisa computers are arriving in Australia, and Apple Australia Pty Ltd has allotted more than 150 to Apple's moninated Lisa dealers to fill orders which have been placed since the launch of Lisa in January.

Myer in ICL deal

THE Myer Emporium Ltd has signed an agreement with ICL Australia to become a Traderpoint dealer, and Myer stores in Melbourne, Brisbane, Adelaide and Perth began marketing the ICL Personal Computer on August 1. The DRS Wordskil 8801 word processing system and the DRS 20 model 25 distributed office systems will be sold in selected centres.

A.Y. taps US market

A.Y. SYSTEMS Pty Ltd, the microcomputer software development company owned by Arthur Young & Co Australia, has reached agreement for the Australian-designed financial planning packages, Planfin and Profin, to be available through 90 per cent of microcomputer retail outlets in the United States.

Sanyo's Mark Johnston and Rod Newton with Telecom's Lori Steel check first deliveries under Sanyo's contract to supply MBC 1000s.

MSA opens in NZ

MANAGEMENT Science America (Australia) Pty Ltd has opened a branch office in New Zealand. Headed by Andrew Burnett, as branch manager and David McLean as senior account manager, the branch will operate from Pleiades Suite, 2nd Floor, Quay Tower, corner Customs and Albert Streets, Auckland.

Award to Dicker

DICKER Data Projects Pty Ltd has been named Vector Graphic's largest international distributor. In a ceremony at the Vector International dealer conference in California, David and Fiona Dicker received an award for their efforts in Australia. Dicker Data has about 600 installations Australia - wide.

Telecom contract

SANYO Data Systems has been awarded a contract to supply Telecom with MBC 1000 personal computers. Mark Johnson, Sanyo Data Systems, managing director, said the Telecom contract is worth approximately $2 million and covers the supply of CP/M-compatible computers up to June, 1985. Telecom will use the coimputers for general applications in both its administrative and technical divisions.

Apple service deal

APPLE Computer Australia Pty Ltd is making final arrangements for the appointment of Control Data Australia Pty Ltd as its third-party maintenance organisation in Australia. The agreement will result in users having access to a nationwide, on-site, maintenance service.

HG for MAI

MAI has established headquarters at Crows Nest, Sydney, to launch its Australian operation. The company occupies the ground and first floors of a strikingly designed building at 20 Clarke St. The offices include demonstration rooms for MAI's Australian product range, full service and spare-parts facilities, as well as an outdoor piazza for entertaining. New phone number for MAI Sydney is (02) 438 2455.

HP donation

The Australian Administrative Staff College in Mt Eliza, Victoria, has received a donation of computer hardware from Hewlett-Packard Australia Ltd. The college, a private enterprise management education institute, received a HP 125 microcomputer, printer and graphics plotter. The software provided by HP includes Visicalc (financial spreadsheet), a database management system and word processing. The college runs six-week residential courses for private enterprise and government senior executives, including some overseas representation.

Digital consultant

ONE of Brisbane's newest computer stores, the Complete Computer Centre, has employed a consultant exclusively to sell the Digital range of personal business computers to local businesses. Mr John Tennock, who has had 12 years' computer experience in the business field, will specialise in serving Complete Computer's Digital customers. The Complete Computer Centre offers the full range of Digital personal business computers

Striking headquarters for MAI in Crows Nest.

Expanded rentals

TECH-Rentals Pty Ltd has expanded its range of rental equipment, adding Hewlett-Packard series 80, 100, 200 and 1000 computers as well as HP terminals and plotters. These are to be available for short, medium or long-term rental, especially to scientific users, complementing Tech-Rentals' Apple, IBM and Osborne PCs.

Further information: Tech-Rentals Pty Ltd, 83-87 Wellington St, Windsor, Victoria. Tel: (03) 51 1303.

Enter K561 on Enquiry Card

IAC on technology

THE Industries Assistance Commission has released a discussion paper on New Technology and Industry Assistance. The commission has asked for comments on the implications of the framework presented in the paper. Copies of the booklet can be obtained from Commonwealth Government Information Offices.

Central Data deal

MOSTYN Enterprises Pty Ltd has been appointed Australian distributor for Central Data Corporation, which manufactures multibus systems, CPU boards and accessories. Its complete line of boards includes CPUs, memories, disk controllers and I/O.

Further information: PO Box 134, Rydalmere, NSW 2116. Telephone (02) 871 6297.

Enter K558 on Enquiry Card

Apple income leaps

Apple Computer Inc has reported an 87 per cent increase in net sales and a 59 per cent increase in net income for its third fiscal quarter, to July 1, 1983, compared to the corresponding period a year ago. For the first nine months of Apple's fiscal 1983, sales were $US709.6 million, 74 per cent higher than the $US407.3 million in the first nine months of 1982. Net income grew 68 per cent to $US71.6 million , or $US1.20 per share, from $US42.6 million, or US74c per share a year ago.

Cruising lecture

MICROLIBRARY International Pty Ltd is launching what many fuel distributors believe is the ultimate computer solution for their industry. Microlibrary has been invited by the Australian Petroleum Agents and Distributors to demonstrate the package at their annual convention. The system operates on any Digital computer from the PC350 model up to the Vax range.

Further information: Microlibrary International, 2 Sir John Young Crescent, Woolloomooloo, NSW, 2011. Tel: (02) 356 3588.

Enter K559 on Enquiry Card

Disk testing

AMPEC Electronics is using a Receiving Test Station (RTS) from Seagate as an incoming inspection test system for any Seagate 5¼in Winchester disk drive. The test parameters covered are drive rotational speed, seek time at error, seek complete time, full cylinder test, rotational speed, seek time at error, seek complete time, full cylinder test, outside and inside window margins, sequential read/write and random read. The RTS is a portable, benchtop self-contained unit which performs a single test sequence that functionally checks the drive unit; up to six drives an hour may be tested with minimum operator intervention.

Further information: Ampec, 114 Terry St, Rozelle, NSW, 2039. Tel: (02) 818 1166.

Enter K560 on Enquiry Card

Time's new factory

BARRY Jones, Minister for Science and Technology opened Time Office Computers' new manufacturing plant at Artarmon, Sydney. Other guests at the opening included Dr Harry Edwards, shadow minister for science and technology, John Spender, shadow minister for aviation and the Mayor of Willoughby, Noel Riedy. The chairman of the company, Michael Roberts, in his welcoming speech emphasises the need to have knowledge-based rather than resource-based industries. Time's 2250 sq. metre plant has the capacity to produce 1200 units a month. The company is increasing its production to meet commitments, particularly from its government department clients.

Boost from merger

THE merger between office automation specialist Lanier and the Harris Corp will give a big lift to local operations, according to Lanier's managing director for Australia, Dave Vucina. The Harris Corporation has indicated that Lanier will operate as a subsidiary under the Lanier Business Products name and under the leadership of the present chairman.

Easy acquisition

INFORMATION Unlimited Software (IUS), one of the top ten independent microcomputer software publishers, has been acquired by Computer Associates International Inc, developer of mainframe and minicomputer software. IUS, which operates in Sausalito, California, with about 100 employees, has been in business since 1977, making it one of the oldest microcomputer application software suppliers in the world. IUS productivity and business software includes EasyWriter II, EasySpeller II, EasyFiler, EasyPlanner and EasyBusiness systems. Computer Associates offers systems software for mainframe computers.

Float filled

VIDEO Classics, a major retail distributor of Commodore home computers, has announced that its public issue of 2,300,000 ordinary 25c shares at a price of 50c per share closed fully subscribed on the opening day, July 1. Applications were well in excess of shares available, it said.

TYPEQUICK

EDUCATIONAL • ESSENTIAL

NOW IN ASSOCIATION WITH Pitman PUBLISHERS

- MASTER TOUCH TYPING IN 15 HOURS USING TYPEQUICK & YOUR MICRO
- BREAK THE KEYBOARD BOTTLENECK • NOW THERE IS AN EASIER WAY

The *TYPEQUICK* course is unique. It is **THE** successful CP/M* keyboard trainer which carries Pitman's approval. Hundreds have been sold to date.

Just 12 lessons is all it takes . Your computer patiently instructs you, continually. *TYPEQUICK* monitors your keystrokes for speed and accuracy and eliminates your weakness by changing the text to suit your needs. *TYPEQUICK* can even be used by ten year olds. Its the key to your future.

Learning is easy with *TYPEQUICK*. Its fun because you type mostly words and sentences – not just boring drills. The computer encourages and reports twice a lesson. It will force up your speed.

All you need is a CP/M* micro. (Osborne, Sharp, DEC, Sanyo, HP, ICL, Morrow, Televideo, Kaypro, Apple)

Get your fingers moving now. *TYPEQUICK* is great value at only $77. Send this coupon now!

THE ONLY PROFESSIONAL COURSE WORTHY OF YOUR TIME & EFFORT
(IT EVEN CARRIES A MONEY BACK GUARANTEE)

AID SYSTEMS
14 Cecil St. Gordon 2072
(02) 498 7428

YOUR NAME
ADDRESS
COMPUTER TYPE
SCREEN
DISK FORMAT
INCLUDE $77 WITH ORDER
Post to AID SYSTEMS 14 CECIL ST GORDON 2072
NOW

* Digital Research trademark

Enter K081 on Enquiry Card

MBG 83

Aid for disabled

SEVERELY handicapped students from the Yooralla Special School in Glenroy, Victoria, have now received the first nine production models of a new electronic companion — a personal computer to help them speak and embark on educational courses.

Designed as a communication system for cerebral palsey sufferers, the compact computer can be powered by the same batteries that run the students' wheelchairs. The system has been developed during the past 18 months by La Trobe University artifical intelligence researcher, Dr Harvey Cohen, from an earlier 400-word memory prototype. Dr Cohen claims his talking communicator is cheaper than similar products and has been designed to handle educational software programs availble for the increasingly popular Australian classroom computer system, the Microbee. The communicator was developed with the help of funds from the Schools Commission and in co-operation with the physio and speech therapy departments at the Glenroy School. The system offers a menu of words from which the right ones are selected by operating a button or a footswitch. These words are stored by the computer until the required sentence has been put together. This is then spoken by the machine. Word processing facilities are available to edit the statements under preparation. For younger children the communicator can offer on the screen, a menu of either pictures or, similar to flash cards, large words.

Video teacher

DICKER Data Projects Pty Ltd recently completed the construction of an inhouse studio with curved walls, floor and ceiling. The studio is the venue for the production of films to assist in training people using Vector Graphic products. Dicker Data recently released a video on Memorite III word processing and the general operation of the Vector 4 computer system. Dicker Data will soon have videos completed for the use of most Vector Graphic software and the operation of all hardware. Each video is available with a handbook providing easy to follow instructions with summaries and revision exercises. The videos are available to fit Beta and VHS systems.

Further information: Dicker Data, 78 Captain Cook Drive, Caringbah, NSW, 2229. Tel: (02) 525 2122.

Enter K538 on Enquiry Card

Tech takes Plexus

A PLEXUS super microcomputer has been selected by the NSW Institute of Technology's School of Computer Sciences to pioneer a new approach to teaching. The new concept allows for the dedication of one piece of equipment to one computer subject per semester. According to Dr Fergus O'Brien, associate head of the school, this concept has been under investigation for some time, but was not viable until the introduction of Plexus.

The institute began looking at the possibilities of introducing the new system of teaching more than a year ago. Honeywell and Prime systems were already installed and utilised for teaching purposes. The cost per terminal of these installations is calculated by taking the capital cost total of the system and dividing it by the number of terminals used per system. The resulting cost is more than $5000 a terminal. Dr O'Brien wanted to install a system which could lower the per terminal cost to $2000. The school has been working with the Plexus for several months and is at the stage of performance testing and benchmarking. Dr O'Brien said the system had run all the school required and it was hoped to demonstrate performance increases of at least 300 per cent by tuning the residency of software in the system.

CP/M seminar

MANAGEMENT Technology Education is presenting three-day seminars in Melbourne and Sydney on CP/M. The seminars will feature the CP/M talents of Les Bell, Bill Bolton and Rod Whitworth and provide possibly the definitive introduction to the CP/M environment. The Melbourne seminar is from September 14-16 and the Sydney seminar from October 10-12.

Further information: Management Technology Education, Box 3939, Sydney 2001. Tel: (02) 29 3030.

Enter K540 on Enquiry Card

Schools probe

THE Schools Commission has finalised the membership of the evaluation working party for the National Advisory Committee on Computers in Schools.

Evaluation — NH Campbell, Tasmanian Department of Education; Diana Banks, ACT Schools Authority; Prof. Michael Scriven, University of Western Australia; Dr Jill Maling, SA College of Advanced Education; Peter Sandery, Angle Park Computing Centre; Frank Mines, Schools Commission.

Home user report

DATAHOME, a group of final year marketing students, will be presenting their report "Home Computer marketing" at Chatswood Town Hall on Wednesday night, October 12. THe report features the first survey of consumer attitudes to home computers and the presentation will give interested people a rare opportunity to hear Commodore managing director Nigel Shepard talk about home computers and Professor Vance Gledhill. Mancert, a group of final year business management students, will also be presenting a report titled "Personal Computers, Implications for Management" at the Shore Motor Inn, Artarmon, at 6pm on October 13.

Further information: Datahome, 1a Gould Ave, Pymble 2075. Tel: (02) 436 3777. Mancert, Box 1175 North Sydney 2060. Telephone: (02) 43 4816.

Enter K539 on Enquiry Card

Careers' advisers responses in IBM study

	NSW %	VIC %	QLD %	WA %	TAS %	ACT %
Have access to computing facilities	90	75	100	100	100	90
Access is inadequate	55	62	31	58	55	50
Difficulty in obtaining information on computing careers:						
— Considerable	—	—	—	8	10	10
— Some	65	77.5	42	25	30	40
— None	35	12.5	58	67	40	50
How well informed on computing career paths?						
— Very well informed	—	—	—	—	—	—
— Well informed	10	—	16	8	—	—
— Adequately informed	75	25	47	5	50	50
— Less than adequate	15	75	32	42	40	40

THE IBM national manpower study of the Australian computer industry contains a lot of information of interest to computer studies teachers and career advisors. The study includes the results of a survey of 200 careers advisers on their understanding of computing as a career. Their main source of information was government pamphlets, and advisers indicated a need for further information on the importance of computing to careers and its impact on job prospects.

Further information: IBM Australia, 168 Kent Street, Sydney 2000. Tel: (02) 234 5678.

Enter K546 on Enquiry Card

Gender bias study

THE British Equal Opportunities Commission has started a project to look at the popularity of computer courses with boys and girls in English secondary schools. The project follows a report that indicated that girls achieved 27 per cent of "O"-level passes in computer studies and 19 per cent of "A"-level passes, and concern expressed by the head of the MEP about gender bias in computer-course enrolments.

DEAD

Disk Editor & Diagnostics gives you access to information stored anywhere on a disk — by file, block, sector or track — physically or logically.

All the functions you ever wanted in a disk editor, in one handy, easy to use package: validation of directories, restoration of erased files, FCB display, quick file erase capability for cleaning up disks, directory display of all files in all user areas and display of disk statistics.

Plus — validates disks, hides bad sectors and validates directories for bad file names and block allocations.

$90.00 including manual and Sales Tax.

SOFTWARE SOLUTIONS

11 ORMOND ROAD ELWOOD VICTORIA 3184 AUSTRALIA

TELEPHONE (03) 531 4607

Enter K062 on Enquiry Card

o obtain further details of
roducts in the editorial columns
r advertisements which carry
n *Enquiry Number,* please use
ne FREE Product Enquiry Ser-
ice. Just enter the Enquiry
lumbers on a Product Enquiry
ard. You may enter as many
nquiries as you like, but not
nore than six to a card please. If
naking more enquiries please
se a second card. Finally,
omplete your name and ad-
ress PLUS Job/Title and In-
ustry codes plus micro infor-
nation which is for statistical
urposes only. Your enquiries
ill be speeded to the companies
oncerned for servicing.

/TITLE CODES:

irector/partner/general manager
o. secretary/other corporate manager
P management; operations; systems analysis;
rogramming; other inhouse DP staff
oftware/systems development
omputer consultants
ffice administrators
echnical/Scientific/R&D
ngineering/Manufacturing management
ccountant/Lawyer/Medicine
larketing/Sales
ducators/Librarians
onsultants (other than Computer Consultants)
tudent
thers ____________________
(Please describe)

ISTRY CODES:

omputers and electronics including
nanufacturers; system and software
ompanies; OEMs; dealers; distributors;
narketers.
lanufacturing, other than computers and
lectronics.
ublic Utilities/Communications Systems/
ransportation.
Vholesale/Retail Trade
inance/Insurance/Banking
lining/Construction/Oil and Refining
usiness/Services (not DP)/Real Estate
ducation/Medicine/Law
overnment — Federal/State/Local
rinting/Publishing/Other Communication
ervices.
R and Advertising
thers ____________________
(Please describe)

FREE Product Enquiry Service

To obtain further details — literature, prices and other information that may be available — for the products described in the editorial columns or from advertisements, enter the number shown at the foot of the item onto the PRODUCT ENQUIRY SERVICE CARD.

You may make as many enquiries as you wish, however, not more than six (6) on any one card please. You may complete more than one card if required.

Finally, enter your name, address, job function and other details and simply pop into the mail.

Your enquiry/s will be passed to the company/s concerned as soon as possible in order that they may forward the information to you. **Enquiries will not be processed after two months following issue date.**

IMPORTANT
In order that you may continue to receive Australian Micro and to use the *Product Enquiry Service* for the information you require from future issues, we suggest you enter a subscription for $20 per year. Usual price for 12 issues is $24.

Product Enquiry Card

australian
Micro
computer magazine

ENTER ENQUIRY NUMBERS

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

Name ____________________
Title (opt.) ____________________
Company (opt.) ____________________
Address ____________________
____________________ Postcode ________
Telephone (optional): (   ) ____________________
Signature ____________________

My job title code is ☐
My industry code is ☐
☐ I use a micro for professional use.
☐ I own a micro for personal use.
☐ I intend buying a micro within 12 months.
☐ Please tick if you are already a subscriber.

Product Enquiry Card

australian
Micro
computer magazine

ENTER ENQUIRY NUMBERS

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

Name ____________________
Title (opt.) ____________________
Company (opt.) ____________________
Address ____________________
____________________ Postcode ________
Telephone (optional): (   ) ____________________
Signature ____________________

My job title code is ☐
My industry code is ☐
☐ I use a micro for professional use.
☐ I own a micro for personal use.
☐ I intend buying a micro within 12 months.
☐ Please tick if you are already a subscriber.

australian
Micro
computer magazine

PRODUCT ENQUIRY SERVICE

The easiest and fastest way to obtain the Information you require.

For details, see reverse side.

australian
Micro
computer magazine

AFFIX
STAMP
HERE

Reader Service Department,
Computerworld Pty. Ltd.,
P.O. Box 929,
CROWS NEST 2065 AUSTRALIA

australian
Micro
computer magazine

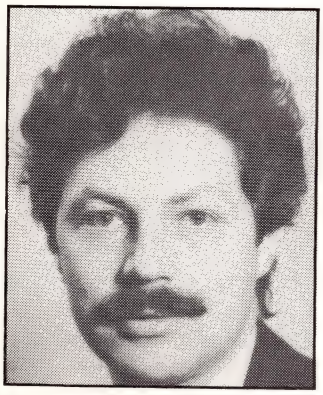
AFFIX
STAMP
HERE

Reader Service Department,
Computerworld Pty. Ltd.,
P.O. Box 929,
CROWS NEST 2065 AUSTRALIA

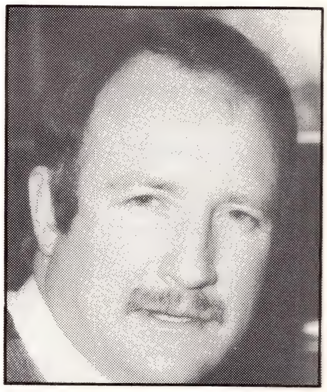
**If you like wha
you're reading
now you'll wan
to be reading i
every month**

**And the only
way to
guarantee tha
is through an
annual
subscription**

**$20 p.a. for 1
issues or just
$1.67 a month
has got to be
one of the
best bargains
around.**



Jim Landau



Mark Johnston

Ardsley Fischer

JIM Landau has been appointed director of business systems of SCA Software Corporation of Australia Pty Ltd. SCA was formed in February this year to specialise in distributing quality microcomputer software to the business and professional community.

DIGITAL EQUIPMENT Corporation (Australia) has appointed **Wayne Rasmussen** as manager of its customer support centre. He has management responsibility for the centre's three major services — telephone support centre, regional support group and personal computer helpline.

ADRIAN van Klaveren has been appointed manager of Mitsui Computer Systems' new computer shop. The shop, at 23 Hamilton Street, Sydney, offers users demonstration and training facilities and replaces the company's original Pips Inn on Pitt Street. He will be responsible for all retail and service enquiries generated by the shop and, in addition, will handle Mitsui's major accounts in Sydney.

NATIONAL manager, shared systems, of Lanier (Australia) Pty Ltd is **Bruce Wren.** He will be responsible for marketing, co-ordinating and developing Lanier's range of large word processing systems throughout Australia.

THE NEW managing director of Sanyo Data Systems is **Mark Johnston.** He was previously chief executive and a director of Interactive Applications (Aust) Pty Ltd, and also a director of Interactive Applications Ltd in New Zealand.

TIME OFFICE Computers has appointed **Michael MacDonald** as national sales manager. Before Time, he was with Sperry as NSW branch manager for 2½ years and in Canberra with Control Data for three years as manager of Federal Government sales.

NEC Information Systems Australia Pty Ltd (NECISA) has announced the promotion of two of its senior executives. **Barry Jeanes** has been appointed general manager, sales and support, and **Jolyon Bone** who had been appointed general manager, marketing and planning has retired.

BILL Middleton has been appointed managing director of AY Systems, the Australian-based microcomputer software development company — a division of Arthur Young & Co, chartered accountants.

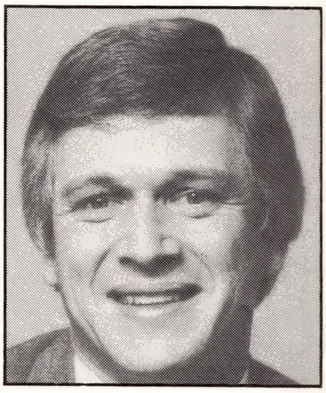
IN LINE with the Nashua disk division expansion plans, **Barry Pritchard** has joined the Victorian sales team operating from Nashua's Melbourne office in Abbotsford. In another move, **Ed Badger** has recently joined to promote Nashua's disk product range in South Australia.

MICHELLE Cahill has joined Case Communication Systems as marketing co-ordinator in its new Sydney office at Frenchs Forest.

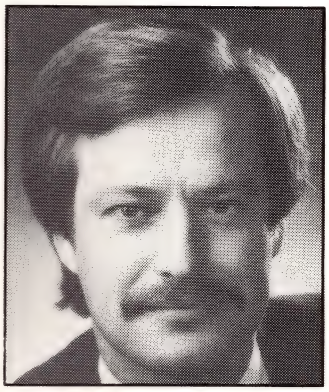
GREG Zwajgenberg has been appointed branch manager of the newly opened Kwikasair Express Computer Delivery operation in Canberra.

ARDSLEY Fischer has been appointed marketing communications manager for Apple Computer Australia. Previously area manager for international advertising & promotions at Apple's headquarters in Cupertino, California, she will be responsible for all Apple's advertising and promotion in Australia and New Zealand.

CONTINUING its rapid expansion in Australia, Apple Computer Australia has announced the appointment of **Ms Margaret Rogers** as national accounts manager. She was previously the marketing manager for Execucom, distributors of IFPS software.



Adrian van Klaveren



Joylon Bone

Margaret Rogers

A NEW GENERATION OF PERSONAL COMPUTERS BEGINS . . .

NEW GENERATION COMPUTER STORE

93 LONGUEVILLE ROAD, LANE COVE 2066. TELEPHONE 427 4780 • 427 4781

DEC PERSONAL COMPUTERS

The low cost high performance RAINBOW 100 and for full office automation the DEC MATE II Fully maintained for 12 months on your premises by one of the largest and most respected computer corporations in the world.

Authorised digital Dealer

427 4780
427 4781
HOTLINE
For our customers hardware and software problems

SALES
SERVICE
SOFTWARE SUPPORT

OSBORNE THE PORTABLE COMPUTER

Standard Features: Numeric Keypard, RS232 and IEEE 48 interface, CP/M operating system. Wordstar word processing with Mailmerge Supercalc spreadsheet usual calculator. C Basic and M Basic **$2,700**
With free amber or green screen

COMMODORE 64

Plugs straight into your television set. **$499**
Home accounting, educational and entertainment programs available. VIC 64 is not just a toy.

HI-RESOLUTION AMBER AND GREEN MONITORS FOR $290

Computer accessories:
Low cost 80 column dot matrix printers with true descenders and graphic capabilities for $800
Full range of application software available on request.

Enter K084 on Enquiry Card

Ram
Rapid Access Marketplace

ACCESSORIES AND DISKETTES

ALPHA MEDIA SALES
307 Mill Point Road, South Perth WA 6151.
Telephone (09) 367 6225.
Western Australian Distributors for the Control Data range of computer media, diskettes, printer ribbons, tapes, disk packs. Also printer stands, ergonomic chairs, cleaning products, all accessories.

DE VERE COMPUTER ACCESSORIES (DCA)
10th Floor, 124 Albert Road, South Melbourne, Vic. 3205.
Telephone (03) 690 8362, or (03) 690 8955.
Offer a full range of media supplies and accessories, currently running specials on diskettes at half price, from $2.70 each plus sales tax.

BOOKSHOP

MULTI-TEXT COMPUTER BOOKS PTY LIMITED
Shop G13 Wallaceway, Chatswood NSW 2067.
Telephone (02) 412 3561.
Books for all computer users — micros to systems. Student texts, programming, operations, business applications.

BUSINESS CENTRE

DICKER DATA BUSINESS COMPUTER CENTRE
261 George Street,
Sydney, NSW 2000.
Telephone (02) 27 6662.
Demonstrations of VECTOR 4, the company computer, general business software, word processing, accounting, etc.
Computer books, magazines and consumables.
Open 9.30-6.00 p.m., Monday to Friday.

BUSINESS SYSTEMS

C.P.M. SYSTEMS
9th Floor, 505 St Kilda Road, Melbourne 3004.
Telephone (03) 267 4755
Complete low-cost: CP/M Based Business Systems, for Hotel, Motel, Restaurant, Real Estate, Service Station, Insurance, Farming, Medical, Dental, etc., Businesses.

CONNECTORS

EAST WEST ELECTRONIC DISTRIBUTORS PTY LTD
117 Smith Street, Fitzroy,
Vic 3065.
Telephone (03) 419 9833.
Specialising in AMP. Electronic connectors. Circular connectors. 'D' type connectors. Heat shrink tubing and cable assemblies to your specifications.

CONSULTANTS

ESP MANAGEMENT SYSTEMS PTY LTD
2 Ella Street, St Leonards NSW 2065. Telephone (02) 439 8055
117 Cardigan St, Carlton Vic 3053. Telephone (03) 347 0555
Retail, Manufacturing, Medical, Client Accounting, Property Management, Education and other Business Systems.
Areas of specialisation: Minis, Micro.

EWR SYSTEMS PTY LTD
1B Emu Plains Shopping Village, NSW 2750.
Telephone (047) 351 1306-07.
CP/M Software (package and custom) hardware consultancy supplies and bureau.

FENWICK SOFTWARE PTY LTD
29th Floor, BHP House,
140 William Street, Melbourne, Vic 3000.
Telephone (03) 67 9265.
A personal advising and consulting service to assist the executive to make effective use of his personal computer.
Building decisions support systems for executives.

O.U. NORMAN HOLDINGS PTY LTD STAFFING CENTRE
Suite 3401 Australia Square Sydney, NSW 2000.
Telephone (02) 241 3741 or (02) 27 8472
EDP Personnel consultants in Australia for over 10 years.

WARWICK WOODWARD ASSOCIATES
56-62 Berry St, North Sydney NSW 2060.
Telephone (02) 929 0500.
Permanent recruitment of data processing staff — advertising campaigns — media selection-shortlisting.

CONTRACT PROGRAMMERS

CREATIVE STRATEGIES PTY LTD
15 Centennial Avenue, Lane Cove NSW 2066.
Telephone (02) 427 5526.
Specialising in M68000 real-time applications.

SPAN COMPUTER CONTRACTS (AUSTRALIA) PTY LTD
56-62 Berry St, Nth. Sydney NSW 2060.
Telephone (02) 929 0500.
Contract programmers, systems analysts, consultants, project management, software packages.

DATA PROCESSING

COMPUTERLIST
14 MacIntosh St, Melrose Park, NSW 2114.
Telephone (02) 85 2872.
For your mailing lists and data management, form letters, tape and disc library catalogue lists.

EDUCATION

W.A. SCHOOL OF COMPUTING
2/294 Rokeby Rd, Subiaco, Western Australia 6008.
Telephone: (09) 382 2692.
LEARN COMPUTER PROGRAMMING
Courses on:
What is a Computer, Buying a Computer, Using CP/M, Wordprocessing & Learning Basic. Correspondence courses and tuition, day and evening.

FURNITURE SUPPLIES

COMPUCARE PTY LTD
2nd Flr., 98 Bay Rd, Waverton NSW 2060.
Telephone (02) 922 5199.
Computer furniture and accessories specialising in computer desks and acoustic covers.

GRAPHICS

ENTERCOM COMPUTER COMPANY
136 Bridge Road,
Richmond 3121.
Telephone: (03) 429 5883.
Graphics, Communications & Interfacing expertise. Engineering, Architectural and Scientific applications..
Sirius and NEC dealers.

HARDWARE

CHOICE COMPUTERS
327 Whitehorse Road,
Balwyn, Vic. 3013.
Telephone (03) 830 5318.
Authorised dealers for:
APPLE, NEC and KAYPRO peripherals.
Wide range of business and professional applications software.
Consulting and training available.

THE INDEPENDENT MICRO COMPUTER SUPPLY COMPANY
820 Elizabeth Street, Waterloo NSW 2017.
Telephone (02) 698 7756, or (02) 698 7666.
Authorised dealers for:
IBM, KAYPRO, NEC , APPLE, COMMODORE, etc. Plus wide range of software and peripherals. As we are independent suppliers you get the right system for your needs.

HARDWARE MAINTENANCE

PERCOMP Personal Computer Services
20/65 Queens Road,
Melbourne, Vic. 3004.
Telephone (03) 529 4651.
Specialists in maintenance of microcomputer equipment.
On-site contracts available.

INSURANCE

EMLTECH PTY LTD
P.O. Box 117, Willoughby NSW 2068.
Telephone (02) 92 4175.
Specialist in computer insurance both personnel and commercial.

MAILING HOUSES

DATAMAIL
17 Barclay Street, Marrickville
NSW 2204.
Telephone (02) 516 3833.
Complete mail processing services of computer addressing, file creation, bursting, folding and inserting of statements, invoices, letters, etc., with max. postage savings.

PRINTING

TRUE BLUE PRINTING
18 Falcon Street,
Crows Nest, NSW 2060.
Telephone: (02) 439 1281.
Personalised continuous stationary.
Your design or one of our extensive range of pre-printed forms.
We can personalise any type of continuous stationery. Specialising in short runs 500 to 5000 forms.
Let us keep the others honest. Give us a ring before placing an order.

PHOTO TYPESETTING

R & R GRAPHICS PHOTO TYPESETTING
1st Floor, 141 York Street,
Sydney NSW 2000.
Telephone (02) 264 2542.
Large selection of type styles available, will set overnight or weekends. Specialists in brochure production and print consultants.

SOFTWARE

SOFTWARE SOLUTIONS (Australia) PTY LTD
144 Pacific Highway, North Sydney NSW 2060.
Telephone (02) 92 0603.
Software tools experts . . .
NUCLEUS is a program generating system for data creation, retrieval, manipulation and reporting which enables the production of new customised applications to be produced by non-technical staff. Programs automatically generated by NUCLEUS as the user interactively responds to simple questions at the terminal.

SOFTWARE

NUCLEUS provides an extensive documentation of Systems as they are built.
NUCLEUS leads the user through the entire process of applications development, eg., a personnel system, with its own database and reporting capabilities incorporating sorting facilities can be created easily and quickly.
A Report Writer is available as a separate module.
NUCLEUS runs on micro systems that run CP/M, CP/M-86, MS/DOS and requires 64K RAM.

SOFTWARE CUSTOMISED

HEURISTIC CONSULTANTS
2/188 Pacific Highway,
North Sydney, NSW 2060.
Telephone (02) 922 6100.
Custom design software for your particular application. Programs to interface to your existing software package and produce the results you want. All software carries a lifetime warranty.

WORD PROCESSING

WORDPRO SETTING
89 Berry Street, North Sydney,
NSW 2060.
Telephone (02) 436 1533.
A bureaux service converting word processing diskettes to phototypesetting diskettes for the trade.
41 W.P. systems for conversions available.

FOR SALE

GEARHART PTY LTD
Telephone: (08) 46 9333.
Second-hand equipment 1-2 years' old.

3 x HP 85 Computers.

1 x HP 45B Computer.

2 x HP 99 15A x Computers.

2 x HP 9875A Cartridge Tape unit.

1 x HP 3497A Data acquisition control unit.

3 x HP 82901M Disk Drives.

3 x HP 7225B Plotters.

WHAT IS RAM?

Rapid Access Marketplace (RAM) is an easy reference listing of manufacturers and dealers of microcomputers systems, software, peripherals and services in a convenient format.

HOW TO PLACE YOUR AD IN RAM

A standard listing is one column wide by two centimetres deep. Additional space is available in one centimetre increments. Your ad will be placed under the heading which classifies the type of product or service being sold. If there is not already a heading in RAM which applies, we will add one for you.

The cost is very low. The minimum available is 3 consecutive issues for $60.60. Discounts are available for increased usage.

Send typewritten copy on your letterhead together with payment to:

AUSTRALIAN MICROCOMPUTER MAGAZINE
RAPID ACCESS MARKETPLACE
37 ALEXANDER STREET
CROWS NEST 2065.
or telephone

Pat: (02) 439 5133. Adele: (03) 690 2933. Winkie: (09) 457 6928.

Next Issue

Product Spotlight on portable computing

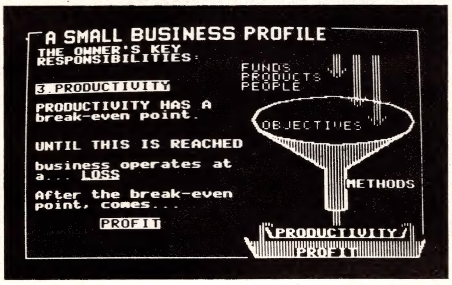
Portable computing marks the return of microcomputer design considerations to personal issues from the distractions of the desktop and home markets. We survey more than 20 portable computers from the "Aunty Jack rip your arms off" transportable to the "What's that suspicious bulge in your pocket?" notables.

What are you going to buy the kids for Christmas?

The Australian home computer market is on the boil with new systems from Coleco, Atari, Spectravideo, Sord, Dick Smith and John Sands challenging Commodore's domination of this market. We survey the market, provide the results of a survey of consumer attitudes, and interview Commodore's Jack "business is war" Trameil, Activision's Tom Lopez, Professor Tom Stonier, game designer Roger Keating and Computer Classics' Roger Davis.

"Are you coming to supper or not?"

We assess a variety of hardware and software



A SMALL BUSINESS PROFILE
THE OWNER'S KEY RESPONSIBILITIES:

3. PRODUCTIVITY

PRODUCTIVITY HAS A break-even point.

UNTIL THIS IS REACHED

business operates at a... LOSS

After the break-even point, comes...

PROFIT

Reviews of the English Torch microcomputer, Radaro's DOT, the ASK financial management package and Bill Budge's extraordinary Pinball Construction Set.

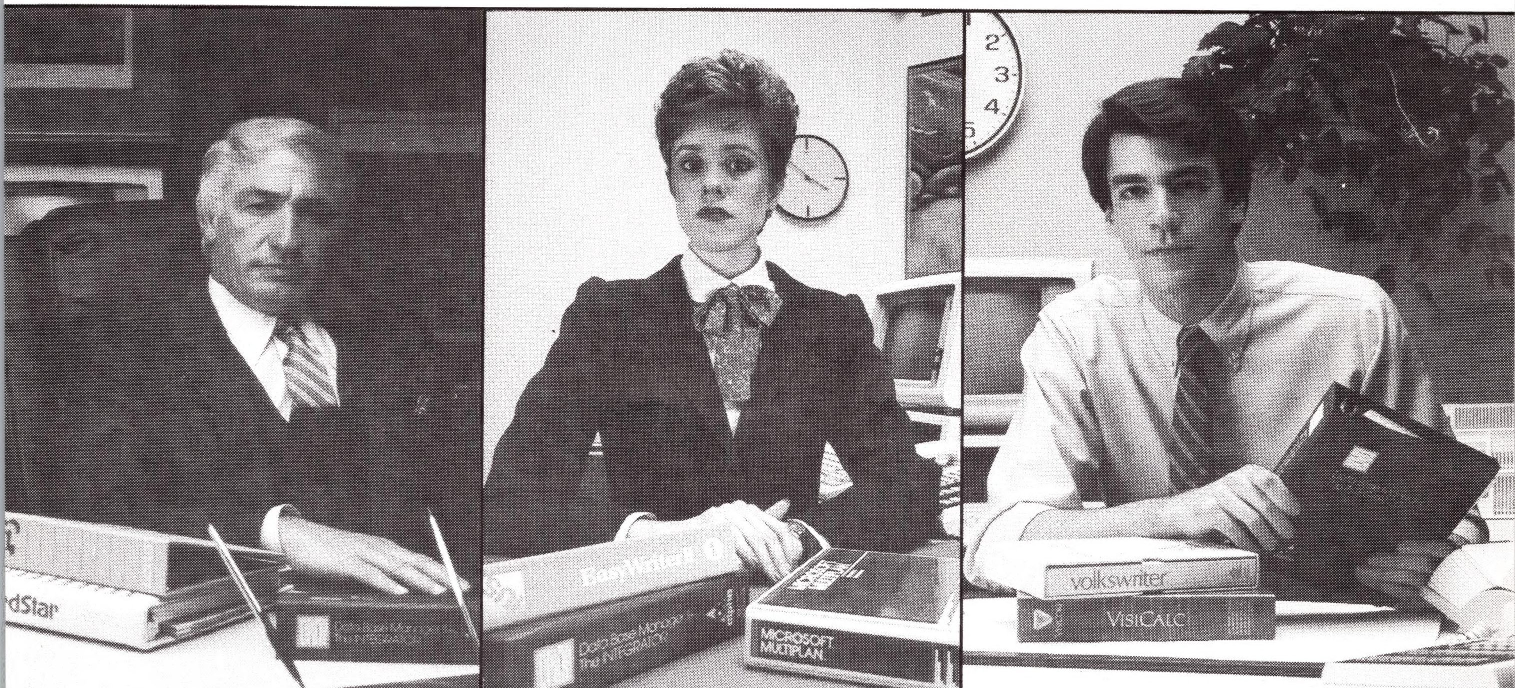
And a top 10ACC report

Coverage of all the micro action at the Tenth Australian Computer Conference.

AD INDEX

AB Office Machines	117
AED Microcomputer Products	62-63
Aid Systems	141
A & M Computer Solutions	13-102
Ampec Electronics	39
Amust Computer Corp	103 to 106
Archives Computers	25
Ausdata	48
BS Microcomp	41
Caulfield Business Computers	134
Commercial & Professional Micro Systems	120
Computer Age	24
Computer Choice	129
Computermax	43
Computerwise	30
Comprocessing Computer Systems	65
Control Data	56
Cycom Computer Systems	24
Data Cable	139
Data Peripherals	50
Data Sat	9
Datascape	14
Dewhirst Corp	78
Dicker Data Projects	49
Direct Data	119
Electromedical Engineering	99
EPS Software Consulting	40
Fox Computers	92
Gavilan Corp.	116
GPW Software Options	115
Imagineering	Inside Front Cover
Insystems	26-28-123
John Sands Electronics	Insert
Juper Micro Craft	109
Kinetic Systems	113
KJ Computers	129
Labtam Equipment	71
Email	81
Logic Shop	130
Macpro Computers	94
Magmedia	53
Micro Country	135
Microcomputer House	37
Micro EDP & Hardware	109
Micro Educational	35
Microfuture	58
Micro Workshop	101
Minit Computer Services	72
Modem Technology	127
NEC Information Systems	54-55
New Generation Computer Shop	143
Non Linear	112
Paperwork Systems Inc	27
Pittwater Computers	125
Prentice-Hall	124
President Office Machines	31 to 34
Pulsar Electronics	74
Radara Computer Devices	44-45
Rapid Ribbon Co, Wholesale	127
RDM Computers	90
Ritronics Wholesale	15
Roland Corp.	126
SCA Software	Inside Back Cover
Scientific Devices	128
SME Systems	100
6 'S' Business Advisory	16
Software Centre	19
Software House	133
Software Solutions (Australia) Pty Ltd	137
Software Solutions	142
Tallgrass Technologies	23
Tandy Corp	51
Tech Rentals	11
Texas Instruments	111
Toshiba	Back Cover
Trans Australia Airlines	114
Verbatim	7
WA Institute of Technology	24
Warburton Franki	22
Wildcat Computer & Software	21
Zagon Computing	107

INTRODUCING DATA BASE MANAGER II™ FROM ALPHA. IT'S FOR PEOPLE WHO HAVE THEIR OWN IDEAS ABOUT WHICH SOFTWARE SHOULD BE INTEGRATED.


WordStar
Data Base Manager II The INTEGRATOR
EasyWriter II
Data Base Manager II The INTEGRATOR
MICROSOFT MULTIPLAN
volkswriter
VisiCalc

Here's a proposition for you.

First thing tomorrow, throw out at least one of your favorite computer programs. Maybe your word processor. Maybe your spreadsheet. Maybe both. Just make sure it's something you like, and that you've spent some time learning it.

Now, start from scratch with programs you don't know. Ones that force you to give up features you depend on now.

Interested?

Well, if you plan to get in on the current "integrated" software rage, that's what you'll have to do. Because most integrated software systems only work with software from one manufacturer.

If you think that's too much to ask, then Data Base Manager II from Alpha is for you.

It starts by giving you an enormously powerful and elegantly approachable data base system. One that's menu driven and responds to simple, English-like commands. But one that's also truly fast. With all the advanced features you'd expect from a top-notch data base management system.

Plus, you get extended DBMS features like phonetic word search, built-in form letter, and date calculations. And a painless way to file data transferred to your PC from other micros, mainframes or information utilities.

And then it lets you do something else. It lets you totally integrate *your* word processor, and *your* spreadsheet program, instantly.

So you can quickly call up and manipulate any information. Then move it over to VisiCalc,® 1-2-3™ or Multiplan™ for calculations. Then shuffle it over to WordStar,® EasyWriter™ or Volkswriter™ for word processing. Without re-entering data. And without complex commands.

In fact, Data Base Manager II lets you integrate nearly any combination of the word processing and spreadsheet programs that run on the IBM PC or XT.

The prestigious software journal, *The Rosen Electronics Letter,* says Data Base Manager II's unique capabilities "unify some of the best of the productivity packages already on the market… This is a signal achievement."

You'll say that this is the way personal computing is supposed to work in the first place.

See the remarkable new Data Base Manager II today.

Call SCA on (03) 347 7011 for the name of the Alpha/SCA dealer nearest you. $395 (plus sales tax if applicable)

DATA BASE MANAGER II™ FROM

alpha SOFTWARE CORP.

SCA

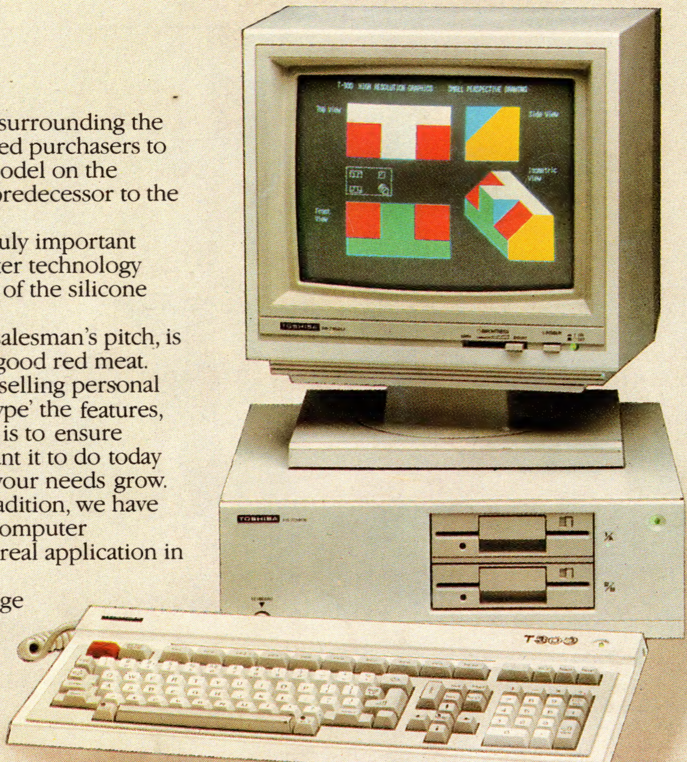
Distributed by:
SCA Software Corporation of Australia Pty Ltd, 449 Swanston St, Melbourne 3000.

TM signifies manufacturer's trademark. ® signifies manufacturer's registered trademark.

Enter K001 on Enquiry Card

COMPUTERS TODAY

Before you buy the sizzle, take a damn good look at the steak.



The environment surrounding the personal computer has led purchasers to expect that every new model on the market will relegate its predecessor to the electronic junkheap.

In truth, the last truly important breakthrough in computer technology came with the invention of the silicone chip in the late 70s.

The rest, like the salesman's pitch, is rather more sizzle than good red meat.

While the trick in selling personal computers may be to 'hype' the features, the trick in owning one is to ensure that it does what you want it to do today and that it will grow as your needs grow.

In the Japanese tradition, we have aimed to perfect those computer components that have a real application in the workplace.

The result is a range of computers that live, not only for today, but also for tomorrow. Computers that grow.

ORIGINALITY IS NOT ALWAYS ALL IT'S CRACKED UP TO BE

Japan's high technology industry will often purchase an innovation from another country and then vastly improve it for their own use.

For instance, the processor in our T300 is the Intel 8088 — the same one that IBM uses.

The T100 uses the Zilog Z80A processor — the same as DIGITAL. Quality and reliability is the most important aspect of the Toshiba product range.

MEMORY. WHAT HAPPENS IF YOU NEED MORE?

The workload any computer is capable of depends largely on its memory. The more information you can store the more useful it is. Most Toshiba computers start with more memory than their competitors but this can inexpensively be doubled or even trebled. This feature may not seem very exciting when you're shopping around, two years down the track it could save you replacing the entire computer.

MORE CHARACTERS

We took the concept of the floppy disk and found a way to use both sides. The result is that you can now store the equivalent of 700 closely typed A4 pages on every disk (twice the storage of the IBM personal computer).

A KEYBOARD THAT ISN'T CONFUSING

Computer companies tend to design keyboards for their personal computers and word processors that look like a 747 flight instruction console. We simply designed ours to a standard typewriter layout.

You'd be surprised how quickly the girls in the office adapt to our hardware. Then we put in a second numeric keypad that makes single handed data entry easy. Accountants love it.

THE ART OF GROWING BIGGER

You have two options. The first is to change computers every three years and the second is to 'grow' your own computer. The second option is by far the less expensive and better one.

You will keep pace with anything on the market simply by adding to your Toshiba Personal Computer.

BIG, RELIABLE AND RELENTLESS

In 1954, the dawn of the computer age, there was seven computer companies and Toshiba was one of them.

In all that time we have grown big by building our reputation of being totally reliable and relentless in the pursuit of those applications that are needed in the marketplace.

It has made us big in computers but more importantly we'll still be around 20 years from now to help build your own growth as a company.

Please send me your free book "Computers made easy" ☐
Send more information on the T300 ☐, T100 ☐ Personal Computers, P1350 ☐, P1010 ☐, P1015 ☐ Printers.

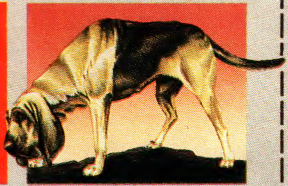
Name ....

Address ....

.... **Postcode** ....

Send to:
Toshiba (Aust.) Pty. Limited,
E.O.E. Division,
82-94 Talavera Road,
North Ryde, N.S.W. 2113.
Or call direct: (02) 887 3322

Toshiba



Big, relentless and effective

TEOE1661

Enter K002 on Enquiry Card